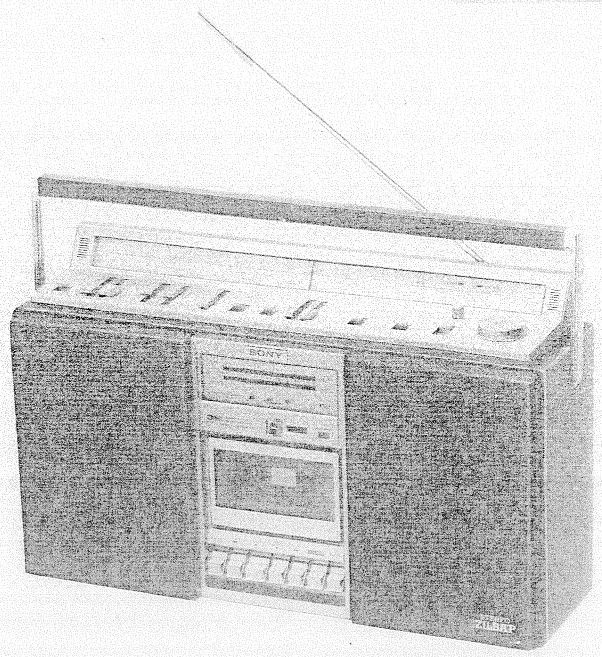
CFS-85S

E Model



FM/SW2/SW1/MW STEREO CASSETTE-CORDEF

SPECIFICATIONS

GENERAL

Power requirements: 110, 120, 220, or 240V ac adjustable, 50/60 Hz
12 V dc, eight batteries IEC designation R20 (size D)
12 V car battery with optional Sony Car Battery Cord DCC-130

Power consumption: 20 W

Battery life: Approx. 6 hours of continuous recording using Sony Super Batteries SUM-1S

Dimensions: Approx. 535 x 317 x 157 mm (W/h/d)
($21^{1}/_{8} \times 12^{1}/_{2} \times 6^{1}/_{4}$ inches)
incl. projecting parts and controls
not incl. handle

Weight: Approx. 8.1 kg (17 lb 14 oz)
incl. batteries

Radio section

Frequency range: FM 87.5–108 MHz
SW$_1$ 2.3–6 MHz (130–50 m)
SW$_2$ 6–18 MHz (50–16.7 m)
MW 530–1,605 kHz (566–187 m)

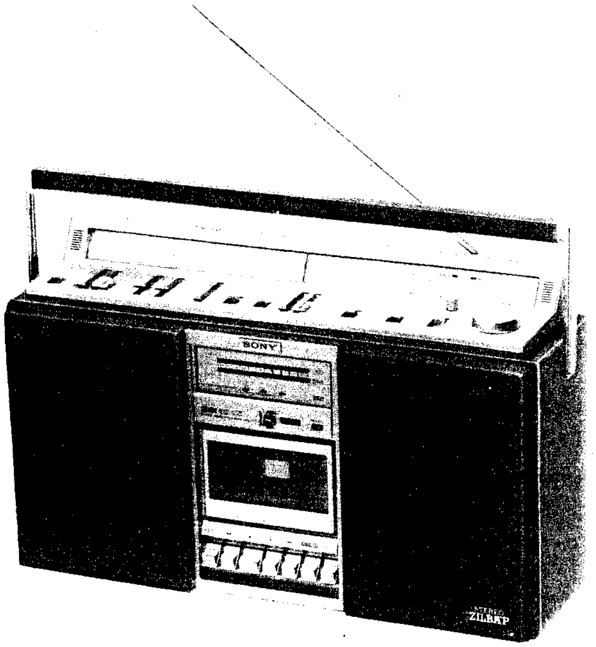
Antennas: FM: Telescopic antenna
External antenna terminals
SW: Telescopic antenna
MW: Built-in ferrite-rod antenr

– Continued on page 2 –

Tape Transport Mechanism Type	MDS-20L6	
	Specification	Test Equipment
Forward Torque	25–50 g·cm (0.34–0.69 oz·inch)	Sony torque meter CQ-101A, 102A, 103A
Fast Forward And Rewind Torque	80–120 g·cm (1.11–1.66 oz·inch)	Sony torque meter CQ-201A
Back Tension Torque	2.5–5 g·cm (0.03–0.07 oz·inch)	Sony torque meter CQ-101A, 102A
Tape Pulling Force	More than 100 g (3.53 oz)	Sony tape tension meter CQ-403
Pinch Roller Pressure	160–235 g (5.64–8.29 oz)	spring scale or tension gauge

SONY

SERVICE MANUAI



SPECIFICATIONS

GENERAL

Power requirements:	110, 120, 220, or 240V ac adjustable, 50/60 Hz 12 V dc, eight batteries IEC designation R20 (size D) 12 V car battery with optional Sony Car Battery Cord DCC-130
Power consumption:	20 W
Battery life:	Approx. 6 hours of continuous recording using Sony Super Batteries SUM-1S
Dimensions:	Approx. 535 x 317 x 157 mm (W/h/d) (21 1/8 x 12 1/2 x 6 1/4 inches) incl. projecting parts and controls not incl. handle
Weight:	Approx. 8.1 kg (17 lb 14 oz) incl. batteries

Radio section

Frequency range:	FM 87.5–108 MHz SW_1 2.3–6 MHz (130–50 m) SW_2 6–18 MHz (50–16.7 m) MW 530–1,605 kHz (566–187 m)
Antennas:	FM: Telescopic antenna External antenna terminals SW: Telescopic antenna MW: Built-in ferrite-rod antenr

– Continued on page 2 –

Tape Transport Mechanism Type	MDS-20L6	
	Specification	Test Equipment
Forward Torque	25–50 g·cm (0.34–0.69 oz·inch)	Sony torque meter CQ-101A, 102A, 103A
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Tape Pulling Force	More than 100 g (3.53 oz)	Sony tape tension meter CQ-403
Pinch Roller Pressure	160–235 g (5.64–8.29 oz)	spring scale or tension gauge

SERVICE MANUAl

Tape recorder section

Recording system:	4-track 2-channel stereo or monaural
Fast winding time:	Approx. 1 min. 30 sec. with Sony Cassette C-60
Frequency response:	50–10,000 Hz (with standard cassette, with the TAPE SELECT switch set to $^{\mathrm{TYPE\ I}}_{\mathrm{NORM}}$) 50–12,000 Hz (with chromium dioxide cassette, with the TAPE SELECT switch set to $_{\mathrm{CrO_2}}{}^{\mathrm{II}}$) or (with FeCr type cassette, with the TAPE SELECT switch set to $_{\mathrm{Fe\text{-}Cr}}{}^{\mathrm{III}}$)
Speakers:	Three-way coaxial type two-way Approx. 16 cm ($6^1/_2$ inches) dia. woofer Approx. 5 cm (2 inches) dia. tweeter mid-range Approx. 5 cm (2 inches) dia.
Power output:	5 W x 2 (max.) at dc operation
Inputs:	Two microphone input jacks (minijack) sensitivity 0.25mV (–70 dB) for low impedance microphone Two line input/phono input jacks (phono jack) with the Input Selector set to LINE IN sensitivity 140 mV (–15 dB) input impedance 47 kilohms with the Input Selector set to PHONO sensitivity 2.5mV (–50 dB) One mixing microphone input jack (minijack) for low impedance microphone
Outputs:	Two line output jacks (phono jack) load impedance 10 kilohms or higher rated output 0.43 V (–5 dB) at load impedance 47 kilohms Two external speaker jacks (minijack) for 4-ohm or 8-ohm impedance speaker Headphones jack (stereo binaural jack) for 8-ohm impedance headphones

0 dB = 0.775 V

Handling Precautions for MOS ICs [IC602(TC4001BP)/IC603(MSM4027)/IC604(TC4011BP)/IC605(TC4081BP)]

Generally, the insulation resistance of the oxide layer in MOS IC structures is very high, and the oxide layer is very thin. Because of this, it is possible that the static voltages usually present on clothes and the human body will be enough to generate a potential difference across the insulator, high enough to cause a breakdown of the insulating layer.

The following precautions should be taken while handling these ICs.

(Particular care should be taken under conditions of low humidity.)

Precautions in Replacing MOS ICs

1. Store new ICs by inserting them into a urethane-polyester cushion (which is somewhat conductive), or wrapping it in aluminum foil, so that all the pins are at the same potential.
   (The ICs should be stored in that manner until mounted on the circuit board.)

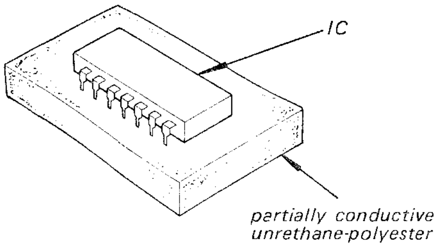

IC
partially conductive unrethane-polyester cushion

Fig. A

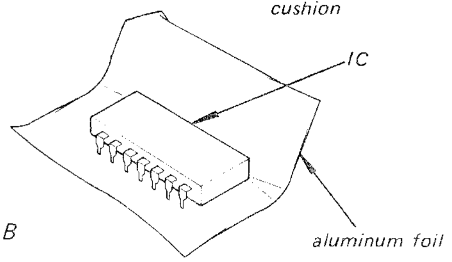

IC
aluminum foil

Fig. B

2. Check the soldering iron for possible power-line leakage current. Make sure that there is no leakage path by connecting an ohmmeter to the tip of the soldering iron and the plug as shown in Fig. C. If there is a leakage path, use some other soldering iron.

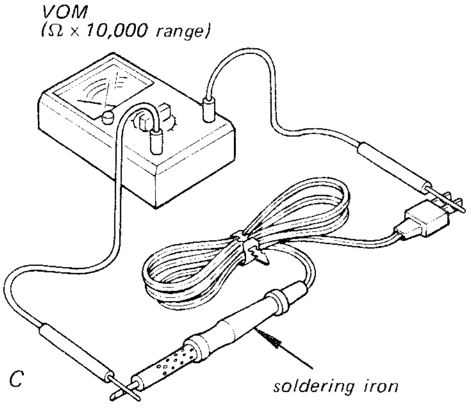

VOM
(Ω × 10,000 range)
soldering iron

Fig. C

3. Equalize any potential difference between the clothes, the tools in use, the work bench, the set being worked on, and the packaged IC by touching them all in succession with the hands or a conductive wire or tool.
4. The following are effective methods for handling ICs that remove the potential difference across the oxide layer.
   - Use a paper clip modified by soldering in a wire braid insert.

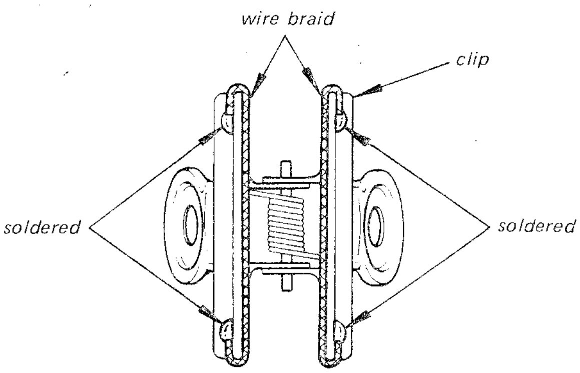

wire braid
clip
soldered
soldered

Fig. D

Make sure that there is no solder on the inside.

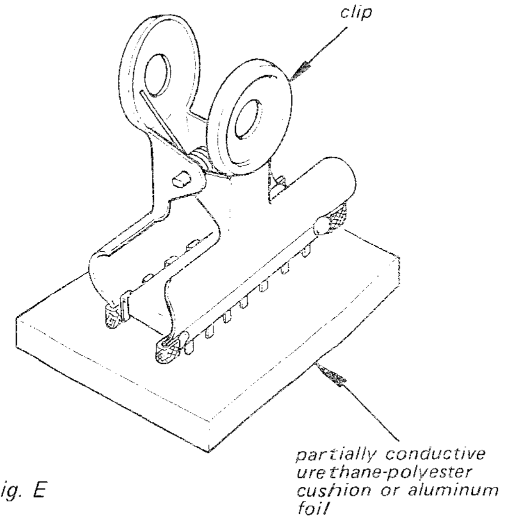

clip
partially conductive urethane-polyester cushion or aluminum foil

Fig. E

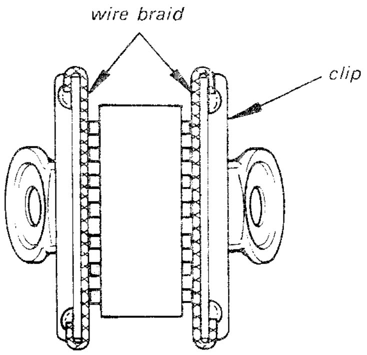

wire braid
clip

Fig. F

Make sure that all the pins are in contact with the wire braid (all the pins will then be at the same potential.).

- Take a short length of fine bare wire and wind it around the IC so that it shorts all the pins of the IC, while it is still in the urethane-polyester cushion or aluminum foil. This ensures that all the pins are at the same potential.

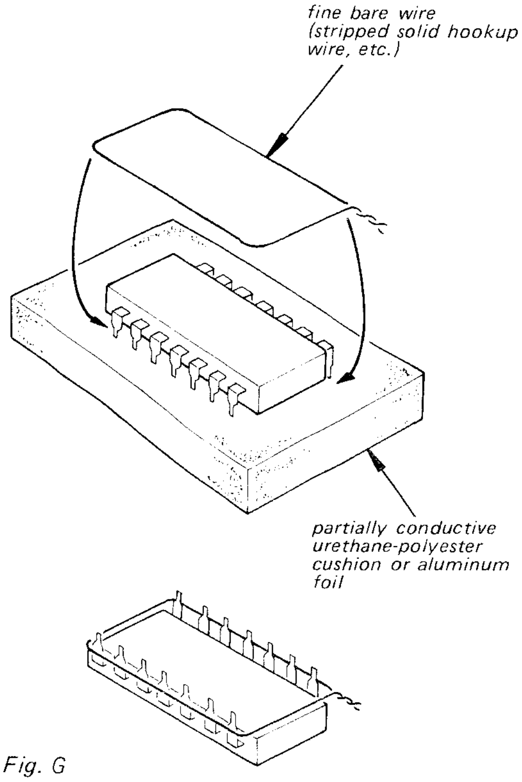

fine bare wire
(stripped solid hookup wire, etc.)
partially conductive urethane-polyester cushion or aluminum foil

Fig. G

- When it is necessary to handle the IC with the fingers, do not touch any pin, and hold the IC at the ends of its plastic-package case as shown in Fig. H.

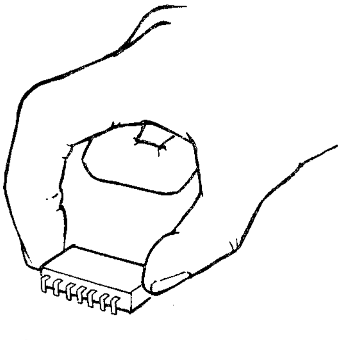


Fig. H

5. Method of Mounting
Insert the IC while holding it with the modified clip, and solder all the pins with the clip still shorting the pins. (Similarly, solder all the pins while the bare shorting wire is still wound around them.). Remove the clip or the bare shorting wire only after all the pins have been soldered.

Precaution while Checking C-MOS ICs

The C-MOS ICs (Complementary MOS) are MOS ICs that have their output sections made up of N-channel and P-channel push-pull stages to increase their speed of operation. If the output terminal of these ICs comes into contact with B+ or B– voltage, then the FET which is ON at that time will either become shorted or open.

This is valid for all the output sections that are connected together by the interconnections. Even the circuits that are physically separated (and not on the same board) can be destroyed simultaneously.

Example:

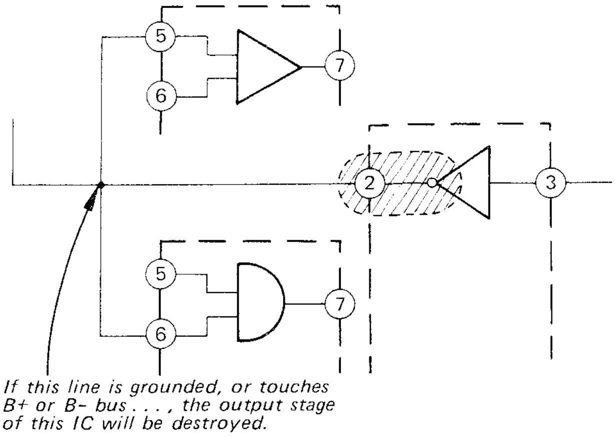

5
6
7
2
3
5
6
7
If this line is grounded, or touches B+ or B– bus . . . , the output stage of this IC will be destroyed.

Fig. I

SECTION 1
OUTLINE

1-1. AMS (Automatic Music Sensor) SECTION CHECKING

Refer to the schematic diagram.

1) AMS SECTION TIMING CHART

H: more than 3 V
L: less than 0.5 V

PROGRAM	IC603					IC604						
	Pin No.					Pin No.						
	①	②	⑤ ⑥	⑭	⑮	① ⑪	② ④	③	⑤	⑥ ⑩	⑧ ⑨ ⑫	⑬
0	L	H	H	H	L	H	L	H	H	H	L	L
"1"	L	H	L	L	H	H	H	L	L	H	L	H
"2"	H	L	H	H	L	H	L	H	H	H	L	L
"3"	H	L	L	L	H	H	H	L	L	H	L	H

PROGRAM	IC605										IC602										
	Pin No.										Pin No.										
	①	②	③	④	⑤	⑥ ⑧	⑨ ⑫	⑩	⑪	⑬	① ⑪	② ④	③	⑤	⑥	⑧ ⑨	⑩	⑫	⑬		
0	H	H	H	L	H	L	L	L	L	H	L	L	H	H	L	–	–	L	H		
"1"	H	L	L	L	L	L	H	L	H	H	H→L	H	L	L	L	–	–	L	L→H		
"2"	L	H	L	H	H	H	L	L	L	L	L	H	L	L	L	–	–	L	H		
"3"	L	L	L	L	L	H	H	H	L	L	L	H	L	L	L	–	–	L	H		
											–	–	–	–	–	H→L	L→H	–	–	The PROGRAM button is pressed.	
											L	L	H	L	H	–	–	L	H	Music selection (recorded selection)	The AMS is set.
											⎍	–	⊔	⎽⎺	⊔	–	–	L	⊔	Blank portion (unrecorded portion)	

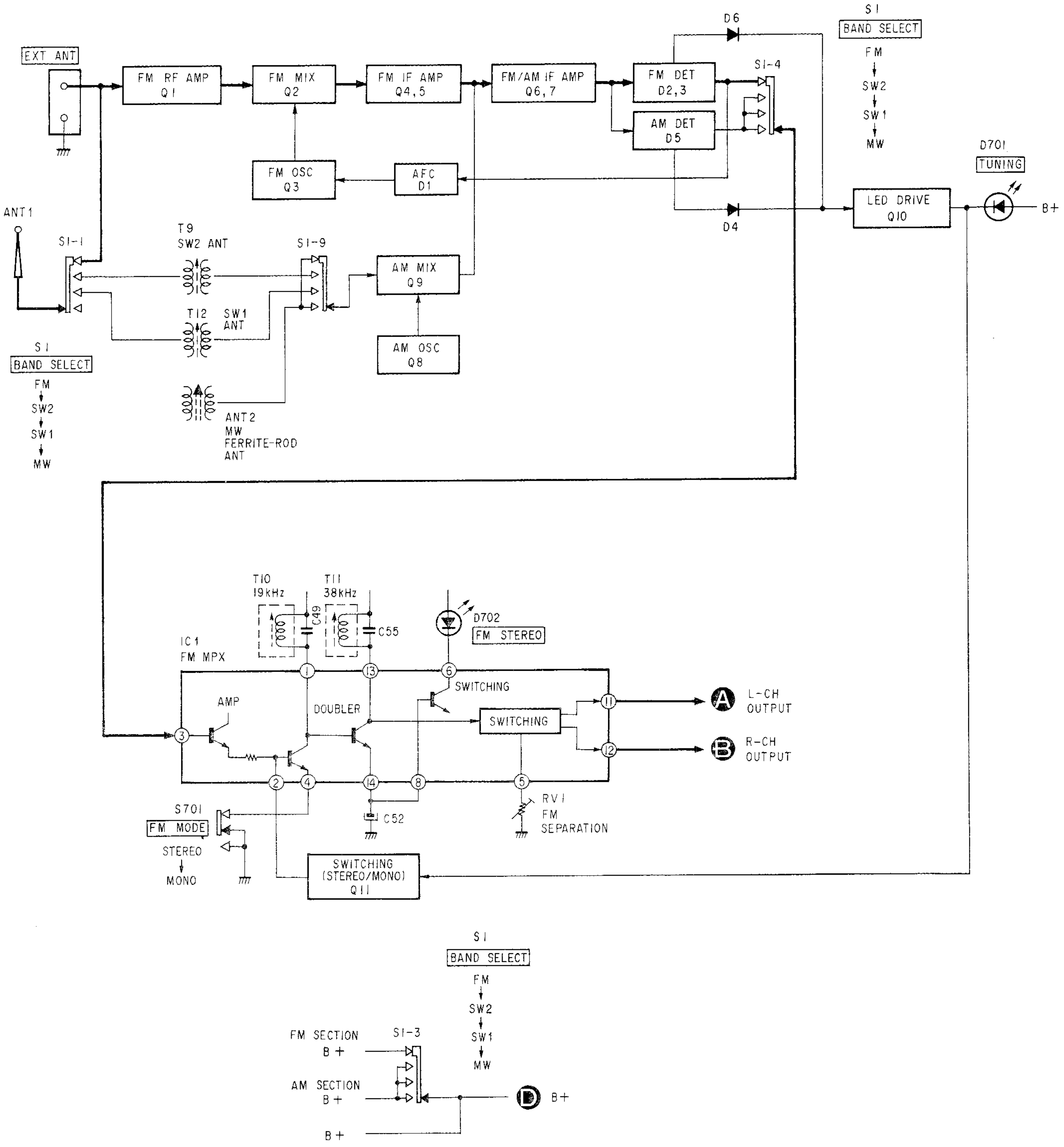
AMS operation
(The FF or the REW button is released.)

When the record/playback head places on the recorded selection of the tape in the AMS mode (The FWD and FF buttons or the FWD and REW buttons are pressed together.), the playback signal is applied to the ② pin of IC601 and is amplified. Then the amplified signal appears at the ⑧ pin of IC601. Therefore, Q601 turns on and the ⑥ pin of IC602 is at H level.

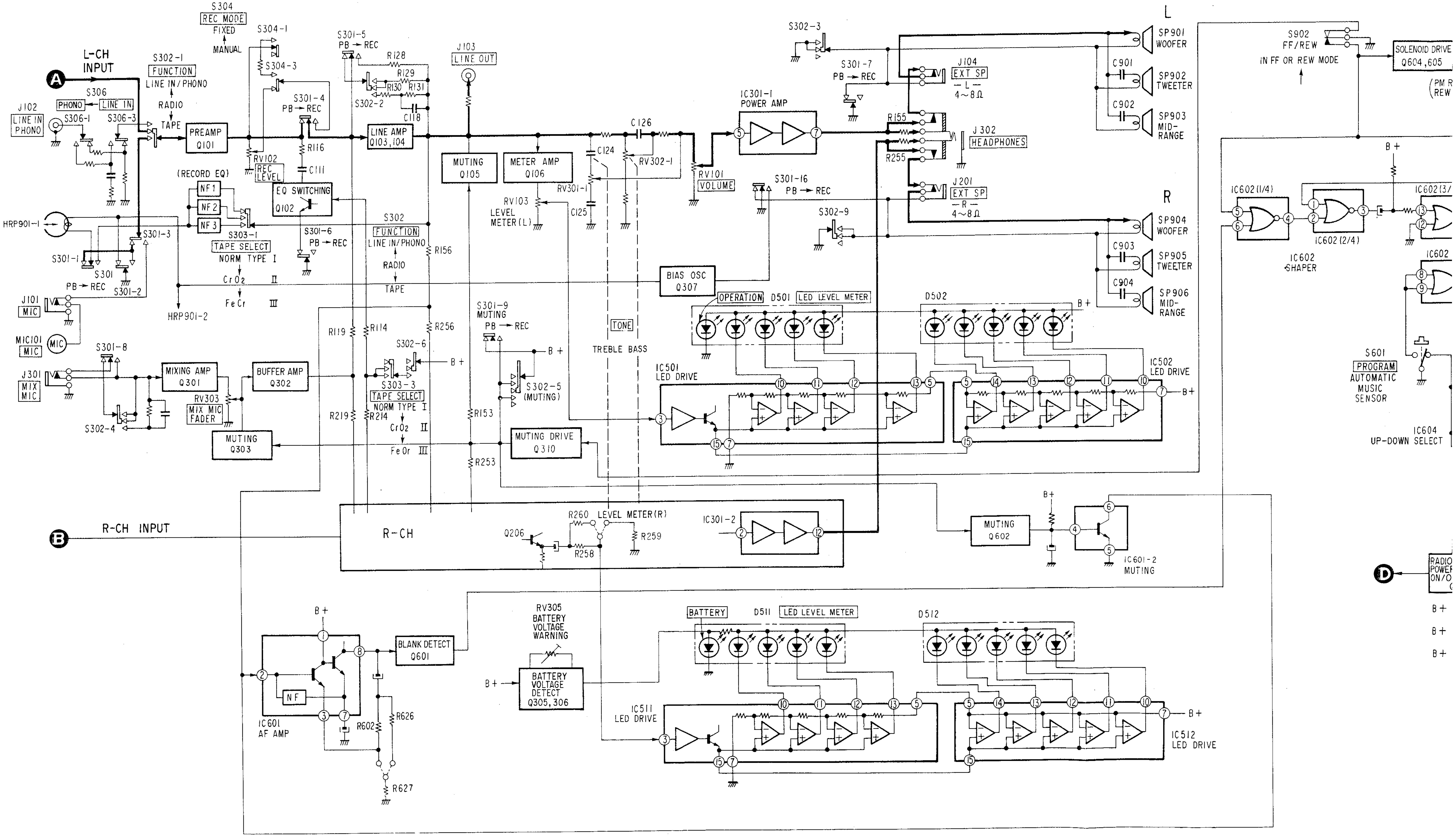
2) Q603 OPERATION

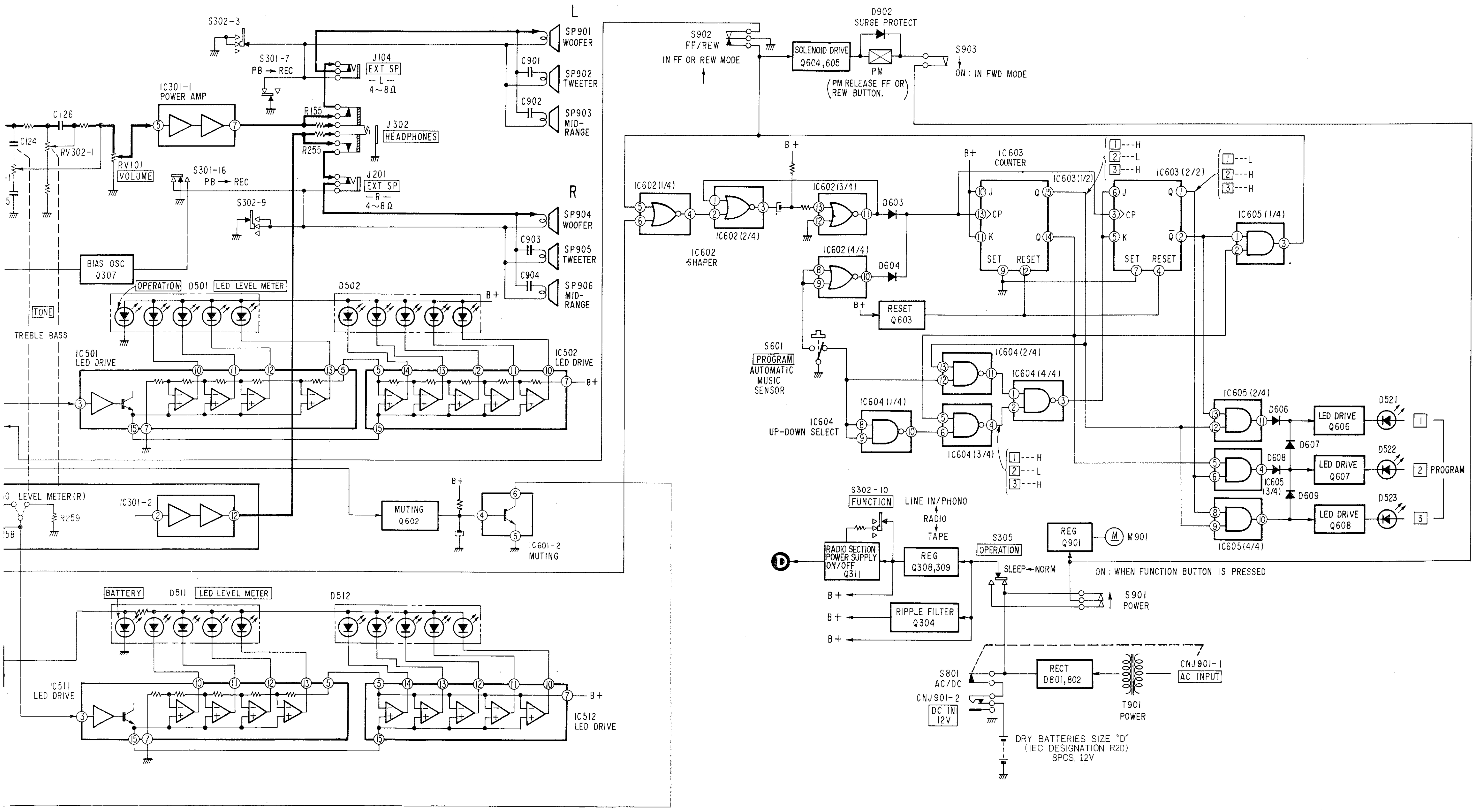
When the POWER switch is turned on. H level signal is applied to the ④ and ⑫ pins of IC603. This resets the PROGRAM. At the same time, B+ voltage charges C609 up and then Q603 is turned on. The H level signal is grounded.

1-2. BLOCK DIAGRAM (Radio Section)


EXT ANT
FM RF AMP Q1
FM MIX Q2
FM IF AMP Q4,5
FM/AM IF AMP Q6,7
FM DET D2,3
AM DET D5
D6
S1-4
S1 BAND SELECT
FM
SW2
SW1
MW
FM OSC Q3
AFC D1
D701 TUNING
LED DRIVE Q10
D4
B+
ANT1
S1-1
T9 SW2 ANT
S1-9
AM MIX Q9
T12 SW1 ANT
AM OSC Q8
S1 BAND SELECT
FM
SW2
SW1
MW
ANT2 MW FERRITE-ROD ANT
T10 19kHz
T11 38kHz
C49
C55
D702 FM STEREO
IC1 FM MPX
AMP
DOUBLER
SWITCHING
SWITCHING
L-CH OUTPUT
R-CH OUTPUT
A
B
S701 FM MODE
STEREO
MONO
C52
RV1 FM SEPARATION
SWITCHING (STEREO/MONO) Q11
S1 BAND SELECT
FM
SW2
SW1
MW
FM SECTION B+
S1-3
AM SECTION B+
B+
D
B+

1-3. BLOCK DIAGRAM (Audio Amplifier Section)

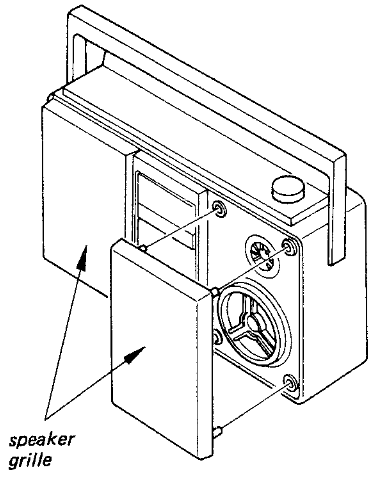

A
L-CH INPUT
J102 LINE IN PHONO
S306 PHONO LINE IN
S306-1
S306-3
S302-1 FUNCTION LINE IN/PHONO RADIO TAPE
S304 REC MODE FIXED MANUAL
S304-1
S304-3
PREAMP Q101
RV102 REC LEVEL
S301-4 PB → REC
R116
C111
EQ SWITCHING Q102
S301-5 PB → REC
R128
R129
R130
R131
S302-2
C118
LINE AMP Q103,104
(RECORD EQ)
NF1
NF2
NF3
S303-1 TAPE SELECT NORM TYPE I CrO2 II FeCr III
S301-6 PB → REC
S302 FUNCTION LINE IN/PHONO RADIO TAPE
R156
HRP901-1
S301-3
S301-1
S301
PB → REC
S301-2
HRP901-2
J101 MIC
MIC101 MIC
S301-8
J301 MIX MIC
S302-4
MIXING AMP Q301
RV303 MIX MIC FADER
BUFFER AMP Q302
MUTING Q303
R119
R114
R219
R214
R256
S302-6
B+
S303-3 TAPE SELECT NORM TYPE I CrO2 II FeOr III
J103 LINE OUT
MUTING Q105
METER AMP Q106
RV103 LEVEL METER(L)
S301-9 MUTING PB → REC
S302-5 (MUTING)
R153
R253
MUTING DRIVE Q310
C124
C125
RV301-1
C126
RV302-1
TONE
TREBLE BASS
RV101 VOLUME
IC301-1 POWER AMP
S302-3
S301-7 PB → REC
S301-16 PB → REC
S302-9
BIAS OSC Q307
J104 EXT SP −L− 4~8Ω
R155
R255
J302 HEADPHONES
J201 EXT SP −R− 4~8Ω
L
SP901 WOOFER
C901
SP902 TWEETER
C902
SP903 MID-RANGE
R
SP904 WOOFER
C903
SP905 TWEETER
C904
SP906 MID-RANGE
OPERATION D501 LED LEVEL METER
D502
IC501 LED DRIVE
IC502 LED DRIVE
R-CH INPUT
B
R-CH
Q206
R260 LEVEL METER(R)
R258
R259
IC301-2
MUTING Q602
IC601-2 MUTING
IC601 AF AMP
NF
BLANK DETECT Q601
R602
R626
R627
RV305 BATTERY VOLTAGE WARNING
BATTERY VOLTAGE DETECT Q305,306
BATTERY D511 LED LEVEL METER
D512
IC511 LED DRIVE
IC512 LED DRIVE
S902 FF/REW IN FF OR REW MODE
SOLENOID DRIVE Q604,605
(PM R REW
IC602(1/4)
IC602(2/4)
IC602(3/
IC602 SHAPER
IC602
S601 PROGRAM AUTOMATIC MUSIC SENSOR
IC604 UP-DOWN SELECT
D
RADIO POWER ON/O
B+


S302-3
L
SP901 WOOFER
S301-7 PB → REC
J104 EXT SP
– L –
4~8Ω
C901
SP902 TWEETER
C902
SP903 MID-RANGE
IC301-1 POWER AMP
C126
C124
RV302-1
RV101 VOLUME
R155
R255
J302 HEADPHONES
J201 EXT SP
– R –
4~8Ω
S301-16 PB → REC
S302-9
R
SP904 WOOFER
C903
SP905 TWEETER
C904
SP906 MID-RANGE
BIAS OSC Q307
TONE
TREBLE BASS
OPERATION
D501
LED LEVEL METER
D502
B+
IC501 LED DRIVE
IC502 LED DRIVE
LEVEL METER(R)
R259
IC301-2
MUTING Q602
IC601-2 MUTING
BATTERY
D511
LED LEVEL METER
D512
IC511 LED DRIVE
IC512 LED DRIVE
S902 FF/REW
IN FF OR REW MODE
D902 SURGE PROTECT
SOLENOID DRIVE Q604,605
PM
(PM RELEASE FF OR REW BUTTON.)
S903
ON : IN FWD MODE
IC602(1/4)
IC602 SHAPER
IC602(2/4)
IC602(3/4)
IC602(4/4)
D603
D604
IC603 COUNTER
IC603(1/2)
IC603(2/2)
J
CP
K
Q
SET
RESET
1---H
2---L
3---H
1---L
2---H
3---H
IC605(1/4)
RESET Q603
S601 PROGRAM AUTOMATIC MUSIC SENSOR
IC604(2/4)
IC604(4/4)
IC604(1/4)
IC604 UP-DOWN SELECT
IC604(3/4)
1---H
2---L
3---H
IC605(2/4)
D606
D607
D608
IC605(3/4)
D609
IC605(4/4)
LED DRIVE Q606
LED DRIVE Q607
LED DRIVE Q608
D521
D522
D523
1
2
3
PROGRAM
S302-10 FUNCTION
LINE IN/PHONO
RADIO
TAPE
RADIO SECTION POWER SUPPLY ON/OFF Q311
D
REG Q308,309
S305 OPERATION
SLEEP ← NORM
REG Q901
M901
ON : WHEN FUNCTION BUTTON IS PRESSED
S901 POWER
RIPPLE FILTER Q304
S801 AC/DC
CNJ901-2
DC IN 12V
RECT D801,802
T901 POWER
CNJ901-1 AC INPUT
DRY BATTERIES SIZE "D" (IEC DESIGNATION R20) 8PCS, 12V

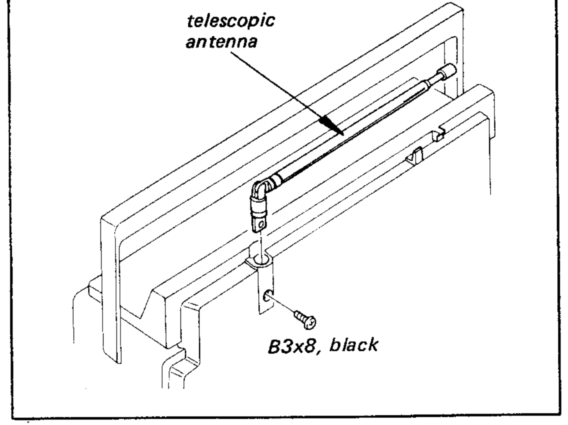
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

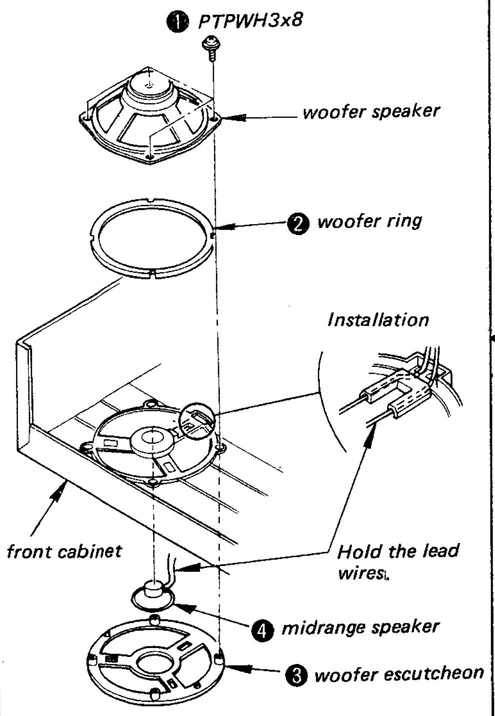
SPEAKER GRILLE


speaker grille

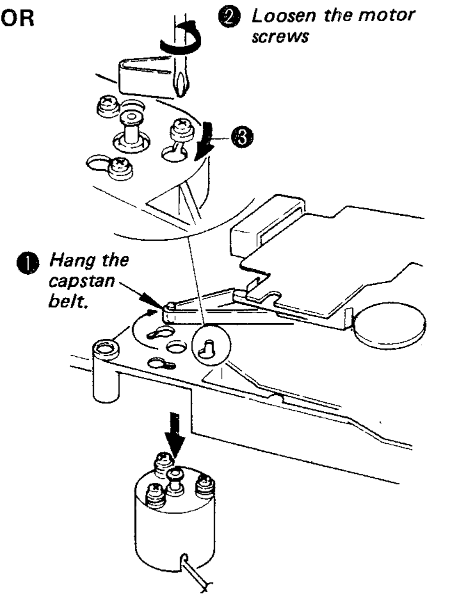
TELESCOPIC ANTENNA


telescopic antenna
B3x8, black

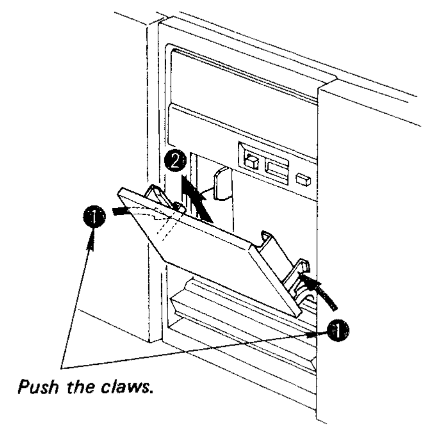
SPEAKER


❶ PTPWH3x8
woofer speaker
❷ woofer ring
Installation
front cabinet
Hold the lead wires.
❹ midrange speaker
❸ woofer escutcheon

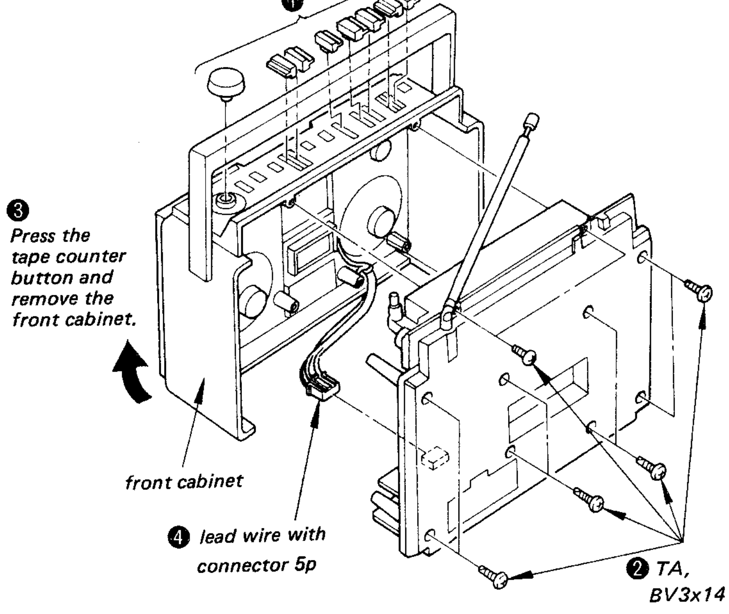
MOTOR


❷ Loosen the motor screws
❸
❶ Hang the capstan belt.

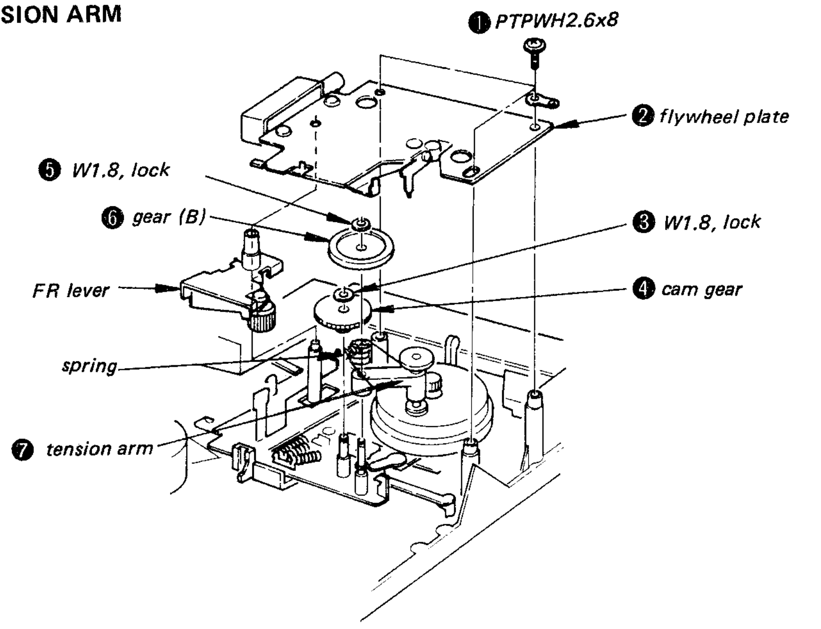
CASSETTE HOLDER


❷
❶
❶
Push the claws.

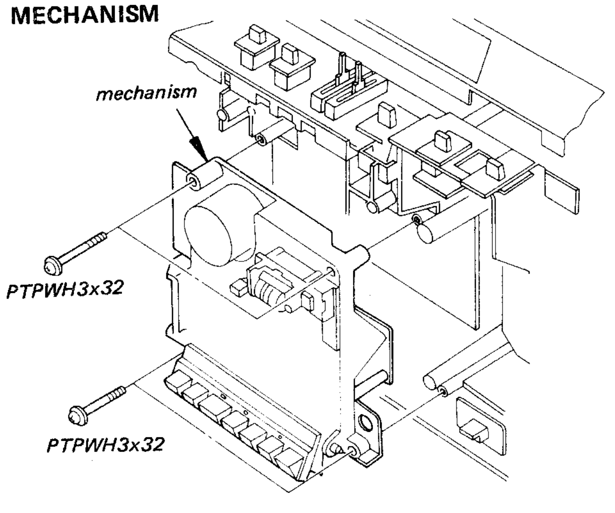
FRONT CABINET


❶
❸ Press the tape counter button and remove the front cabinet.
front cabinet
❹ lead wire with connector 5p
❷ TA, BV3x14

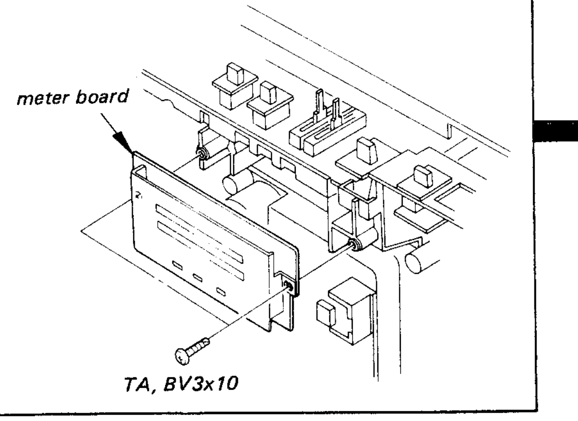
TENSION ARM


❶ PTPWH2.6x8
❷ flywheel plate
❺ W1.8, lock
❻ gear (B)
❸ W1.8, lock
FR lever
❹ cam gear
spring
❼ tension arm

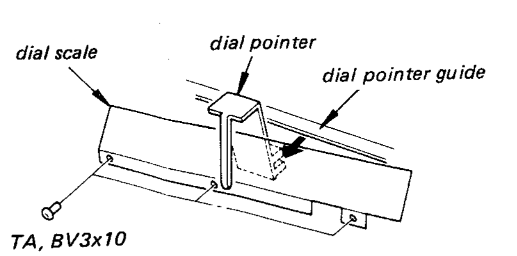
MECHANISM


mechanism
PTPWH3x32
PTPWH3x32

METER BOARD

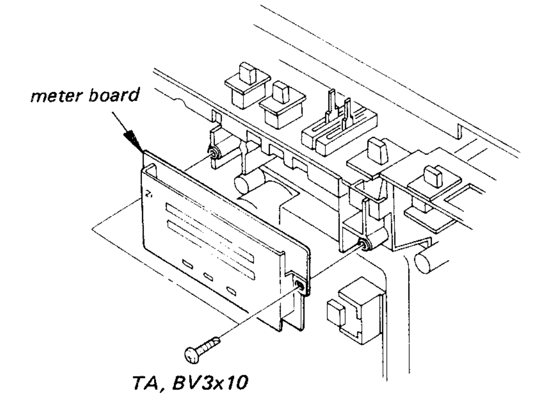

meter board
TA, BV3x10

DIAL SCALE AND DIAL POINTER

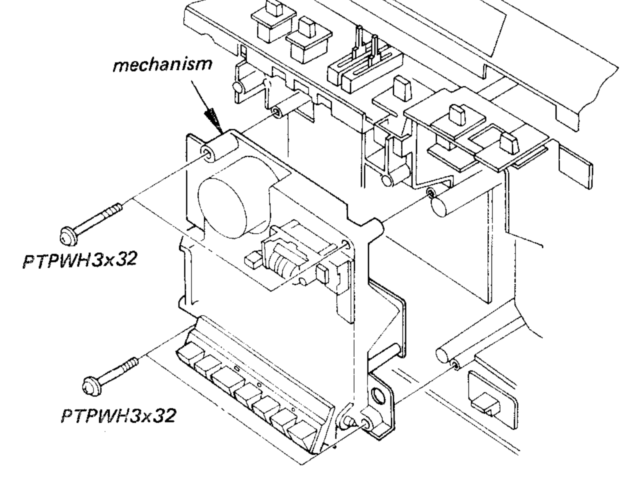

dial scale
dial pointer
dial pointer guide
TA, BV3x10

RADIC

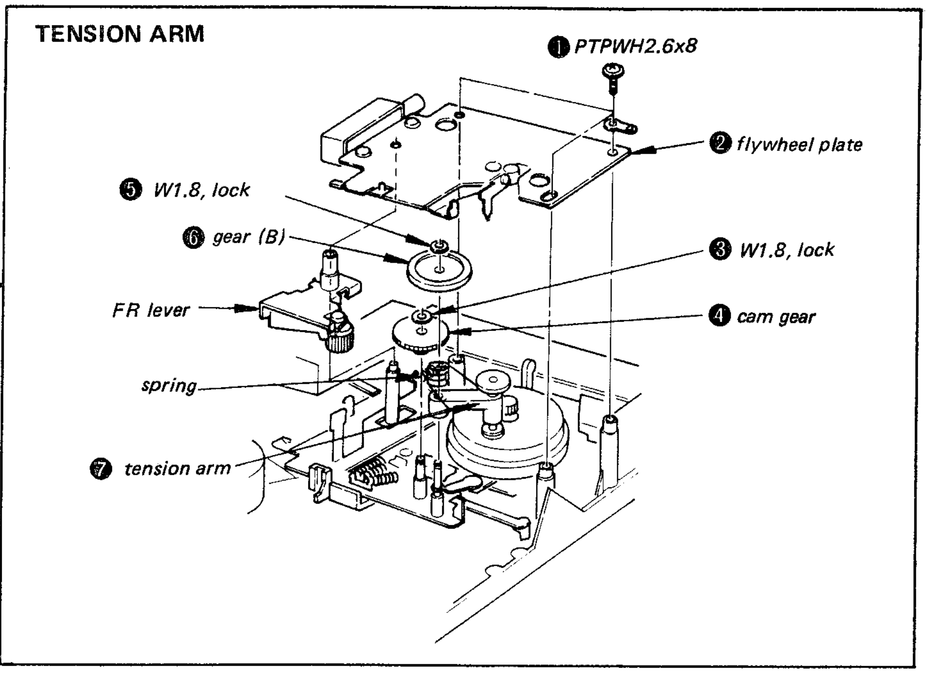
METER BOARD


meter board
TA, BV3x10

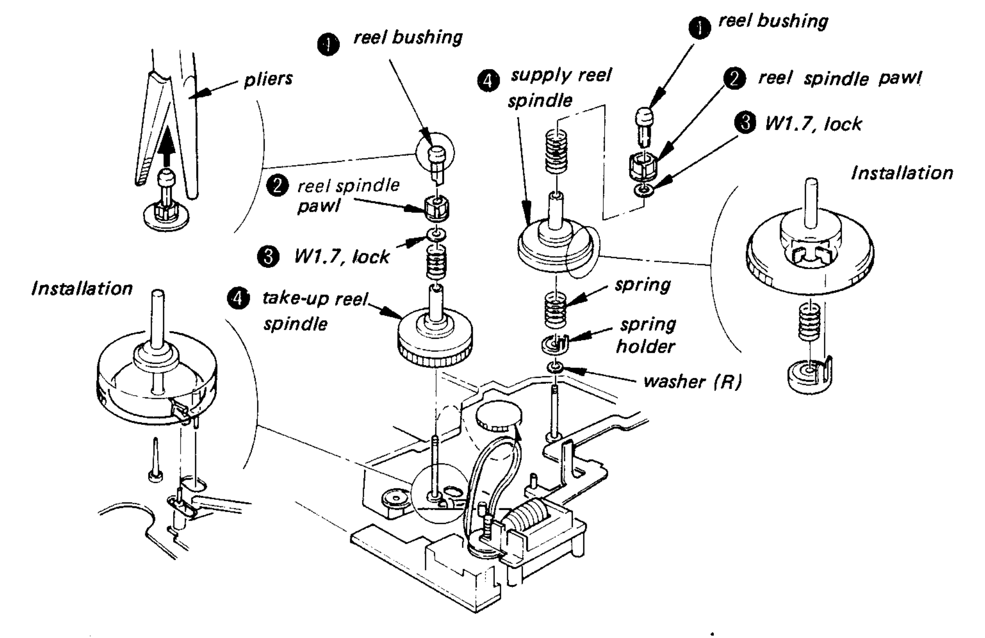
MECHANISM


mechanism
PTPWH3x32
PTPWH3x32

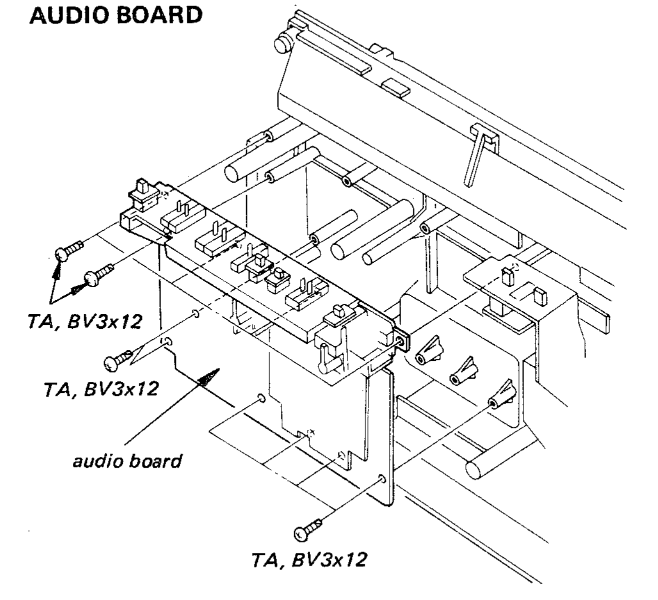
TENSION ARM


❶ PTPWH2.6x8
❷ flywheel plate
❺ W1.8, lock
❻ gear (B)
❸ W1.8, lock
FR lever
❹ cam gear
spring
❼ tension arm

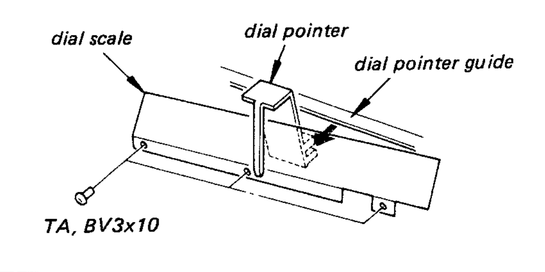
REEL SPINDLE


pliers
❶ reel bushing
❷ reel spindle pawl
❸ W1.7, lock
❹ take-up reel spindle
Installation
❹ supply reel spindle
spring
spring holder
washer (R)
❶ reel bushing
❷ reel spindle pawl
❸ W1.7, lock
Installation

AUDIO BOARD


TA, BV3x12
TA, BV3x12
audio board
TA, BV3x12

DIAL SCALE AND DIAL POINTER

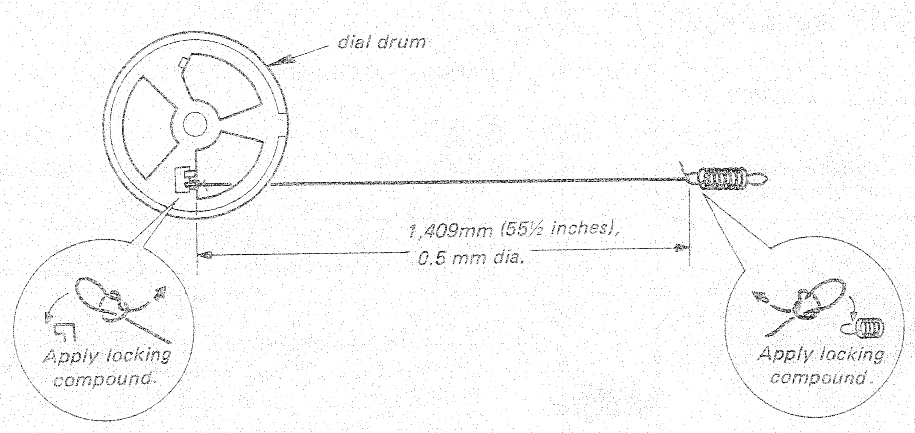

dial scale
dial pointer
dial pointer guide
TA, BV3x10

RADIO BOARD

DIAL CORD STRINGING
(described on the next page)

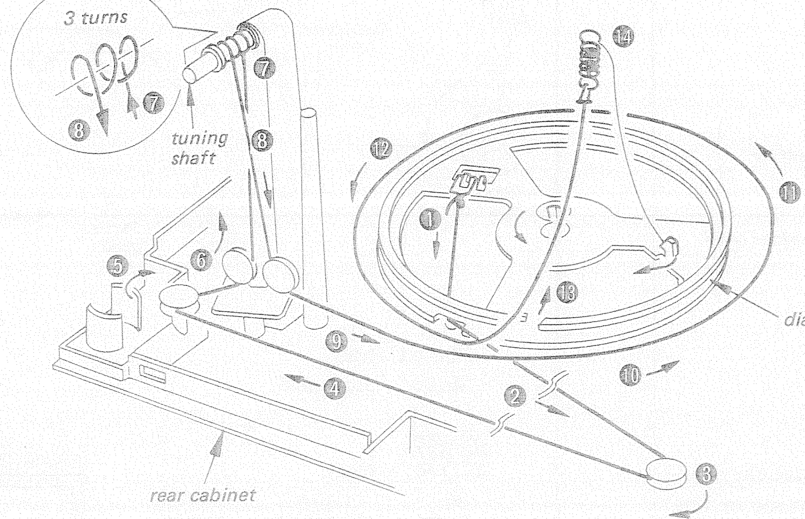
DIAL CORD STRINGING

1) Preparation


dial drum
1,409mm (55½ inches),
0.5 mm dia.
Apply locking compound.
Apply locking compound.

2) Stringing

Turn the dial drum fully clockwise.


3 turns
⑦
⑧
tuning shaft
⑦
⑧
⑭
⑫
⑪
①
⑬
⑤
⑥
dial drum
⑨
④
⑩
②
③
rear cabinet

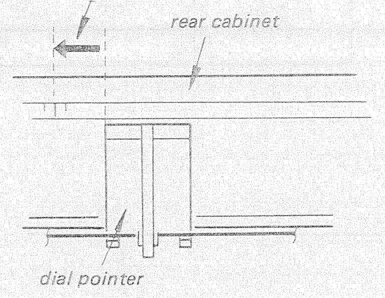
3) Radio Board Installation

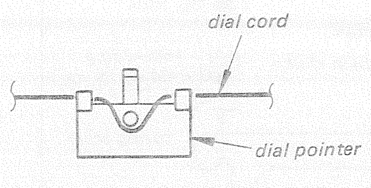
1. Turn the shaft of the tuning variable capacitor fully clockwise.
2. Turn the tuning shaft counterclockwise.
3. Insert the shaft of the tuning vaiable capacitor into the dial drum.
4. Install the radio board.

4) Dial Pointer Installation

Turn the tuning shaft fully counterclocisies.

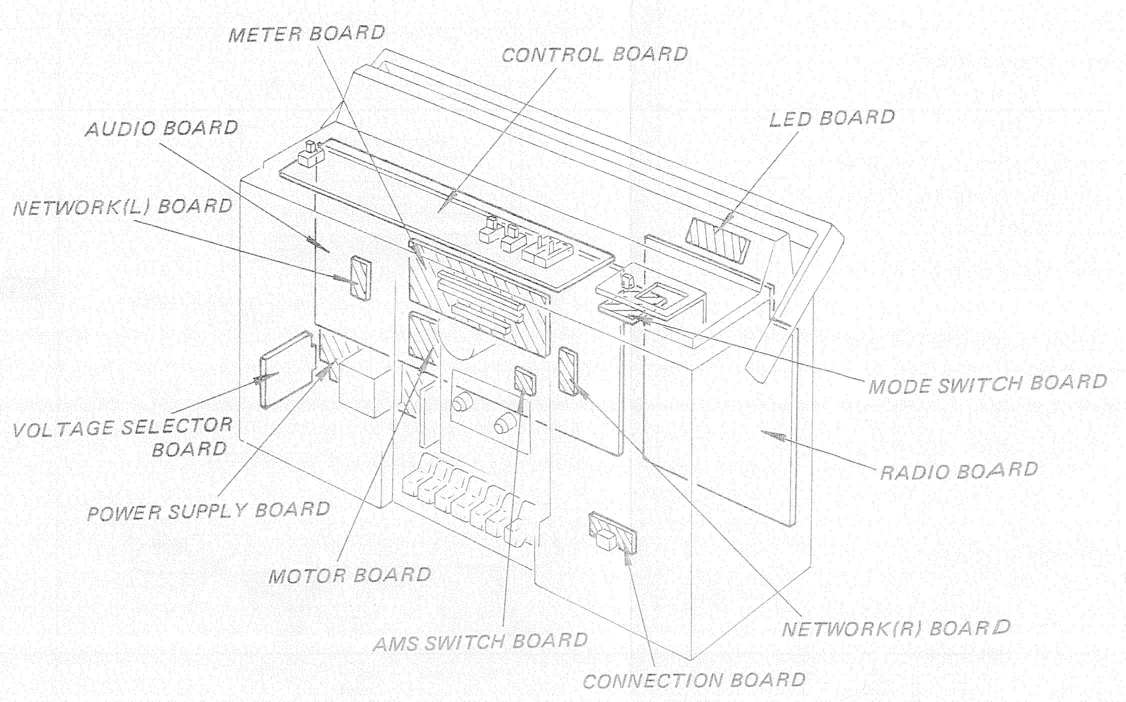
Place the dial pointer edge on the center mark.


rear cabinet
dial pointer

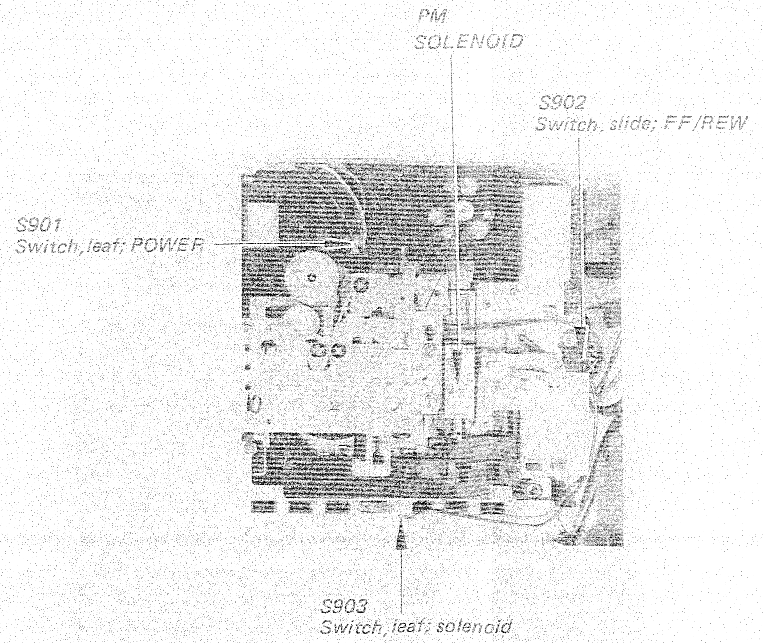

dial cord
dial pointer

Apply locking compound.

CIRCUIT BOARD LOCATION


METER BOARD
CONTROL BOARD
AUDIO BOARD
LED BOARD
NETWORK(L) BOARD
MODE SWITCH BOARD
VOLTAGE SELECTOR BOARD
RADIO BOARD
POWER SUPPLY BOARD
MOTOR BOARD
AMS SWITCH BOARD
NETWORK(R) BOARD
CONNECTION BOARD

INTERNAL VIEW


PM SOLENOID
S902
Switch, slide; FF/REW
S901
Switch, leaf; POWER
S903
Switch, leaf; solenoid

SECTION 3
ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:

record/playback head	pinch roller
erase head	rubber belts
capstan	idlers

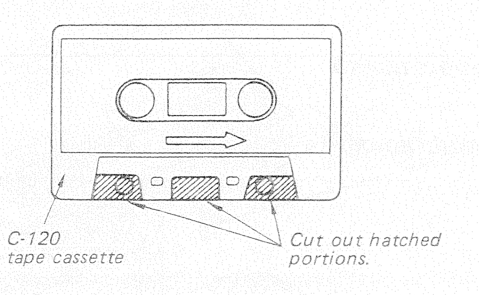
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply a suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

3-1. MECHANICAL ADJUSTMENTS AND MEASUREMENTS

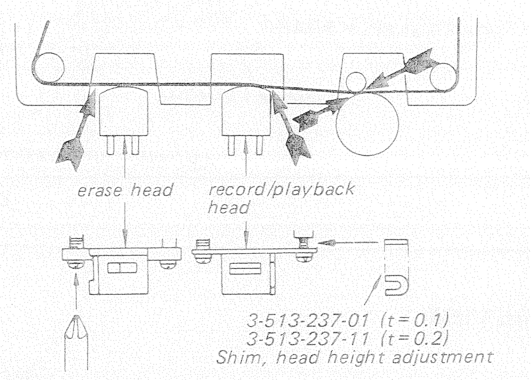
Tape Transport Mechanism Type	MDS-20L6	
	Specification	Test Equipment
Forward Torque	25–50 g·cm (0.34–0.69 oz·inch)	Sony torque meter CQ-101A, 102A, 103A
Fast Forward And Rewind Torque	80–120 g·cm (1.11–1.66 oz·inch)	Sony torque meter CQ-201A
Back Tension Torque	2.5–5 g·cm (0.03–0.07 oz·inch)	Sony torque meter CQ-101A, 102A
Tape Pulling Force	More than 100 g (3.53 oz)	Sony tape tension meter CQ-403
Pinch Roller Pressure	160–235 g (5.64–8.29 oz)	spring scale or tension gauge

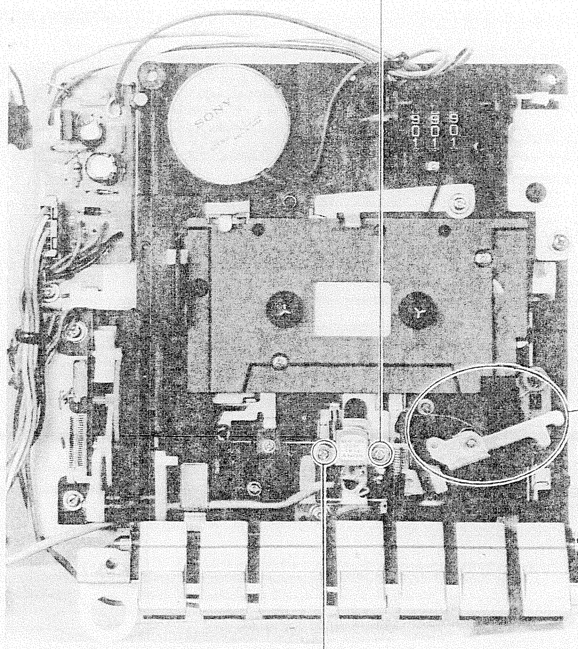
Head Height Adjustment

1. Prepare an adjustment cassette as shown below.


C-120
tape cassette
Cut out hatched portions.

2. In record mode and viewing from the front, adjust the head heights to eliminate tape curl and tape twist at arrowed portions.

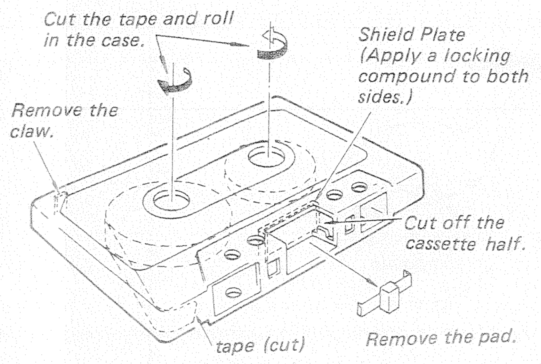

erase head
record/playback head
3-513-237-01 (t=0.1)
3-513-237-11 (t=0.2)
Shim, head height adjustment

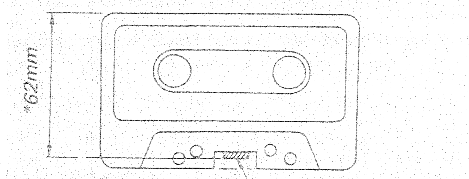


Record/playback Head Installation and Position Adjustment

This adjustment is performed for the cue signal detection in AMS mode.

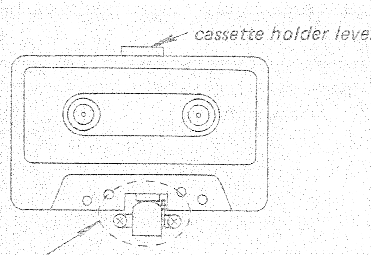
1. Modify the cassette tape as shown below.


Cut the tape and roll in the case.
Shield Plate (Apply a locking compound to both sides.)
Remove the claw.
Cut off the cassette half.
tape (cut)
Remove the pad.



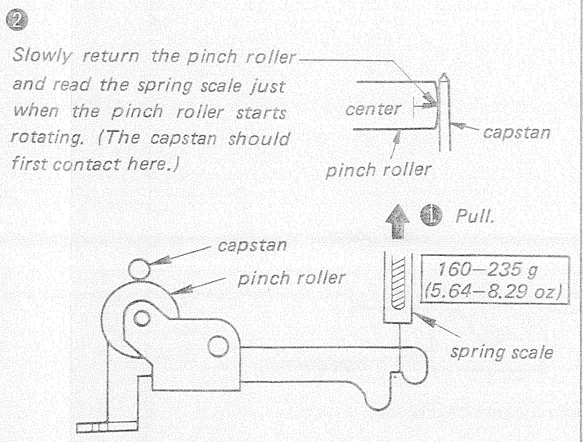
Fix a suitable spacer with a locking compound to obtain the length marked by *.

2. Set the cassette tape into the unit.


cassette holder lever

3. Install the head so that the head touches the spacer when the FWD and FF buttons or the FWD and REW buttons are pressed at the same time.

Pinch Roller Pressure Adjustment
– Playback Mode –


center
capstan
pinch roller
Pull.
capstan
pinch roller
160–235 g (5.64–8.29 oz)
spring scale

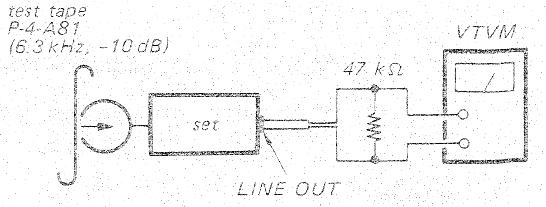
② Slowly return the pinch roller and read the spring scale just when the pinch roller starts rotating. (The capstan should first contact here.)

① Pull.

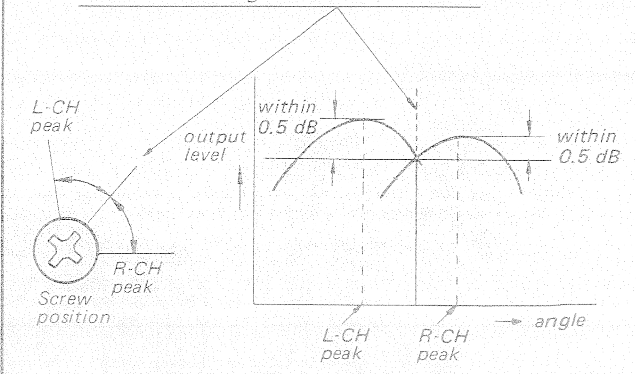
Record/playback Head Azimuth Adjustment

Procedure:

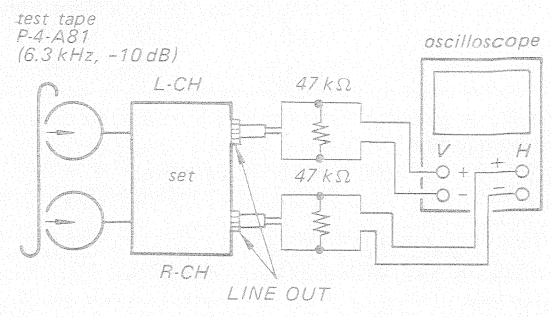
1. Mode: playback

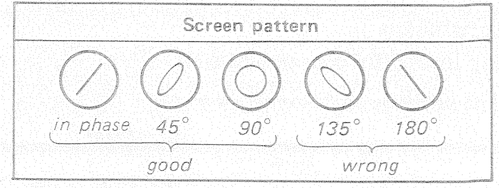

test tape
P-4-A81
(6.3 kHz, -10 dB)
VTVM
47 kΩ
set
LINE OUT

2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 0.5 dB.


L-CH peak
output level
within 0.5 dB
within 0.5 dB
R-CH peak
Screw position
L-CH peak
R-CH peak
angle

3. Phase Check
Mode: playback

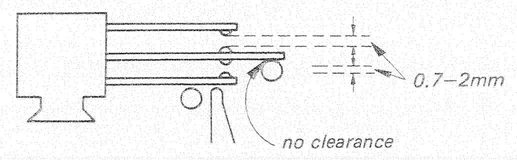

test tape
P-4-A81
(6.3 kHz, -10 dB)
oscilloscope
L-CH
47 kΩ
set
47 kΩ
V
H
R-CH
LINE OUT


Screen pattern
in phase
45°
90°
135°
180°
good
wrong

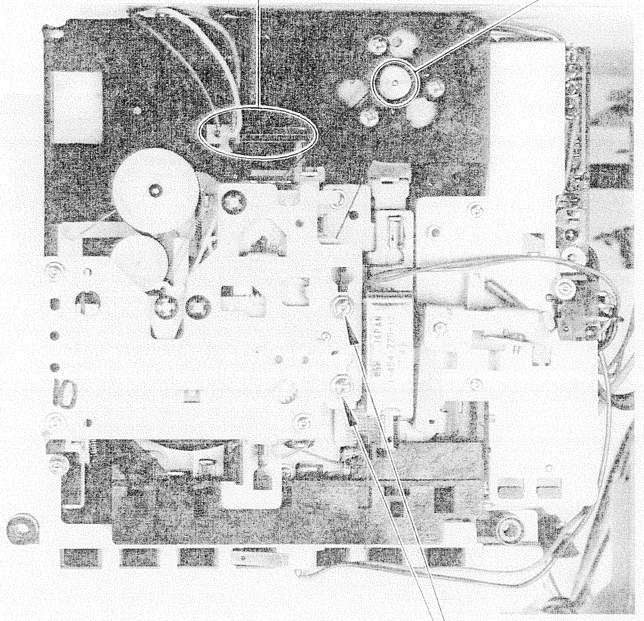
3-2. ELECTRICAL ADJUSTMENTS

S901 (POWER) Position Adjustment

– Stop Mode –

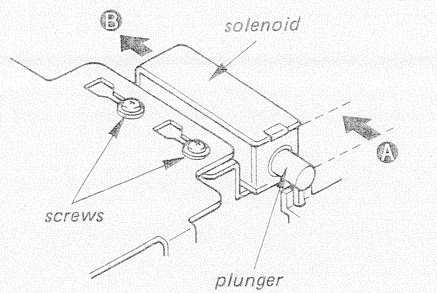

0.7–2mm
no clearance

If necessary, replace the switch.



Solenoid Position Adjustment

1. Press the FF (or REW) button and the FWD button together.
2. Slide the solenoid toward Ⓑ with the plunger pressed toward Ⓐ.
3. When the FF (or REW) button is released, stop the solenoid.
4. Tighten the screws.


Ⓑ
solenoid
Ⓐ
screws
plunger

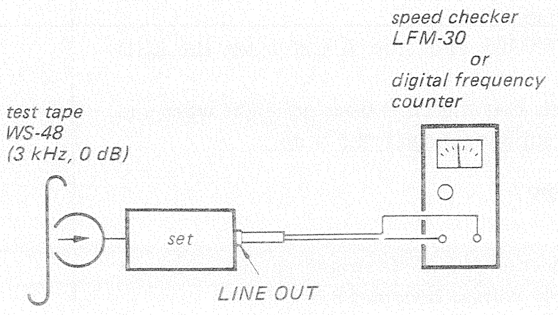
Tape Speed Adjustment

Setting:

VOLUME control: mechanical mid

Procedure:

Mode: playback


speed checker
LFM-30
or
digital frequency
counter
test tape
WS-48
(3 kHz, 0 dB)
set
LINE OUT

Specification:

Speed checker	Digital frequency counter
−2.5 to +3 %	2925 to 3090 Hz

Frequency difference between the beginning and the end of the tape should be within 1% (30 Hz).

If necessary, replace the motor pulley.

Motor pulley Part No.	Marking	Tape speed change	
X-3558-615-5	E	+2.5%	faster
X-3558-615-4	D	+1.5%	↑
X-3558-615-3	C	standard	
X-3558-615-2	B	−1.5%	↓
X-3558-615-1	A	−2.5%	slower

Note: Perform the head height adjustment.

B+ Voltage Adjustment

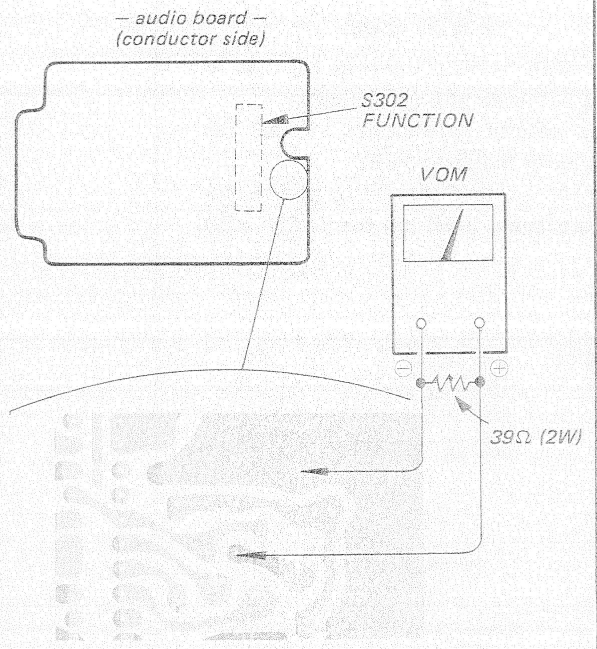
Setting:

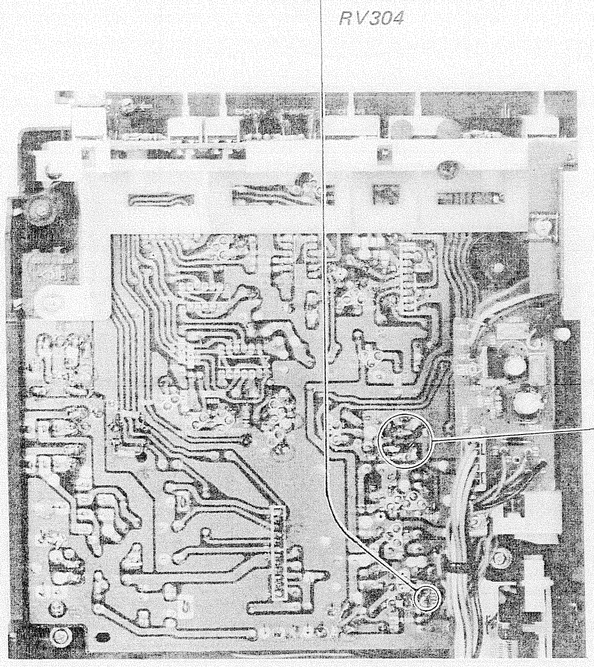
Power supply voltage: 12 V dc
FUNCTION switch: RADIO
VOLUME control: minimum

Procedure:

Connect a resistor (39Ω, 2W) and adjust RV304 for 6 V VOM reading.

Adjustment Location:


– audio board –
(conductor side)
S302
FUNCTION
VOM
⊖
⊕
39Ω (2W)



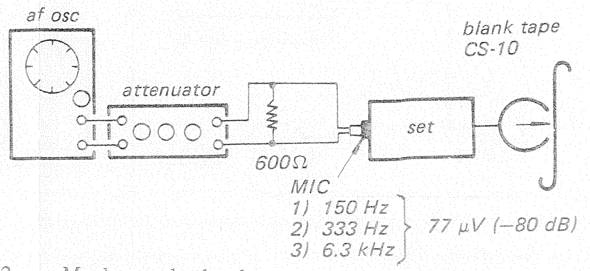
Record Bias Adjustment

Setting:

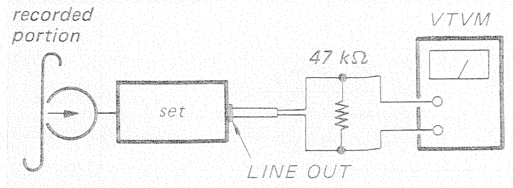
FUNCTION switch: TAPE
TAPE SELECT switch: NORMAL TYPE I
REC MODE switch: FIXED

Procedure:

1. Mode: record


af osc
attenuator
600Ω
set
blank tape
CS-10
MIC
1) 150 Hz
2) 333 Hz
3) 6.3 kHz
77 μV (−80 dB)

2. Mode: playback

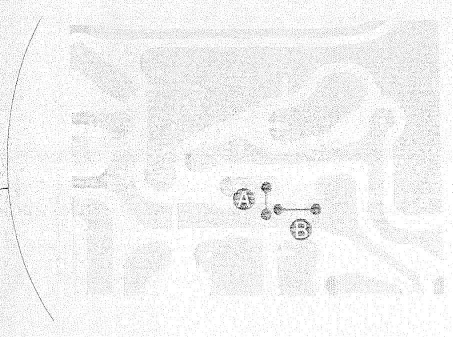

recorded
portion
set
47 kΩ
VTVM
LINE OUT

3. Playback the three signals. The biggest difference between two of them should be less than 6 dB. If necessary, change the pattern connections and repeat the steps given above.

Pattern connection	6.3 kHz VTVM reading
Ⓑ	high
Ⓐ	↑↓
Ⓐ + Ⓑ	low

Adjustment Location:

– audio board –



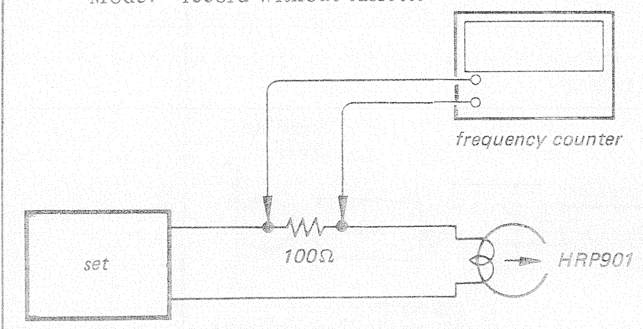
Record Bias Oscillation Frequency Adjustment

Setting:

FUNCTION switch: TAPE

Procedure:

Mode: record without cassette

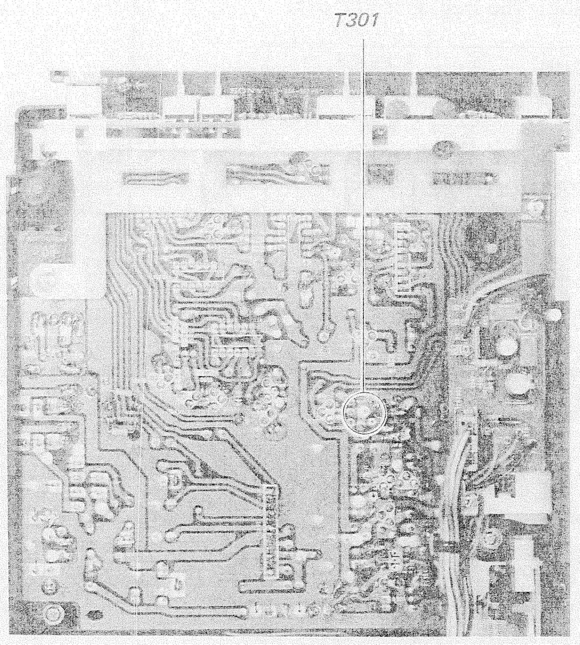


Adjust T301 for the specified value.

Specification:

ISS switch position	Counter reading
1	85 kHz ± 3 kHz
2	81 kHz ± 3 kHz

Adjustment Location:
– audio board –

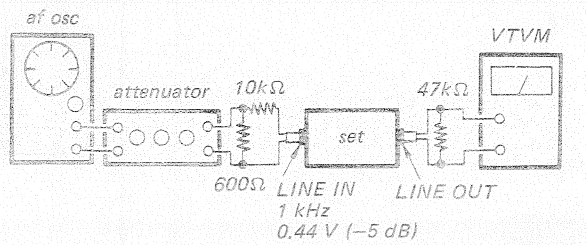


LED Level Meter Calibration

Setting:

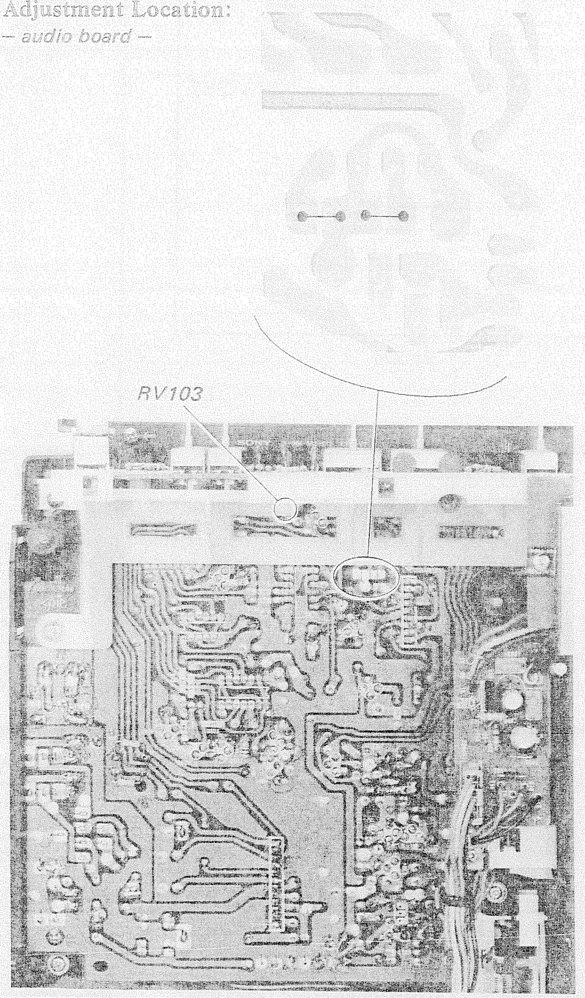
FUNCTION switch: LINE IN/PHONO
LINE IN/PHONO switch: LINE IN
REC MODE switch: MANUAL

Procedure:



1. Adjust the REC LEVEL controls for 0.44 V (–5 dB) output levels of both channels.
2. Change the pattern connections so that the R-CH LED meter indicates 0 dB.
3. Adjust RV103 so that the L-CH LED meter indicates the same level as the R-CH LED meter.

Adjustment Location:
– audio board –



BATTERY Indicator Adjustment

Setting:

Power supply voltage: 8.8 V dc
FUNCTION switch: LINE IN/PHONO

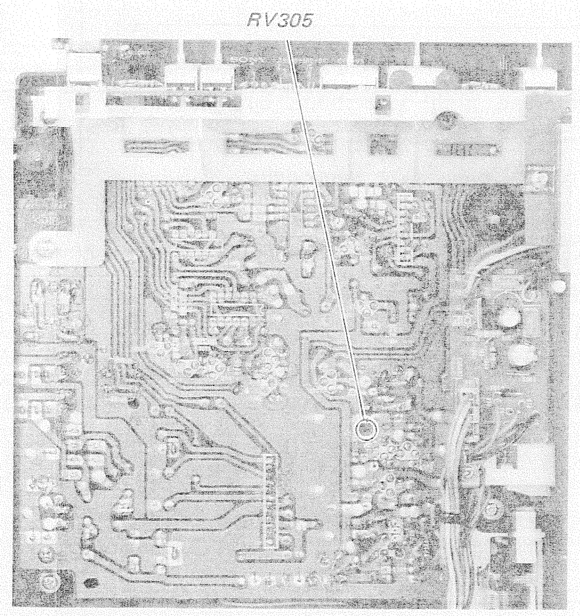
Procedure:

1. Turn RV305 so that the BATTERY indicator LED goes out.
2. Turn RV305 and stop it just when the LED lights.
3. Confirm that the LED does not light when the power supply voltage is 8.5 V dc.

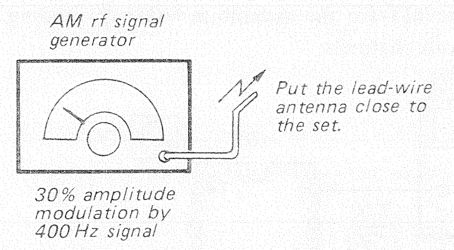
Specification:

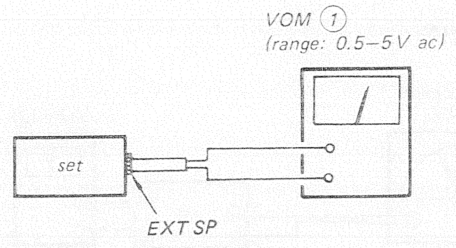
The battery indicator LED should go out when the power supply voltage becomes 8.6 V dc.

Adjustment Location:
– audio board –

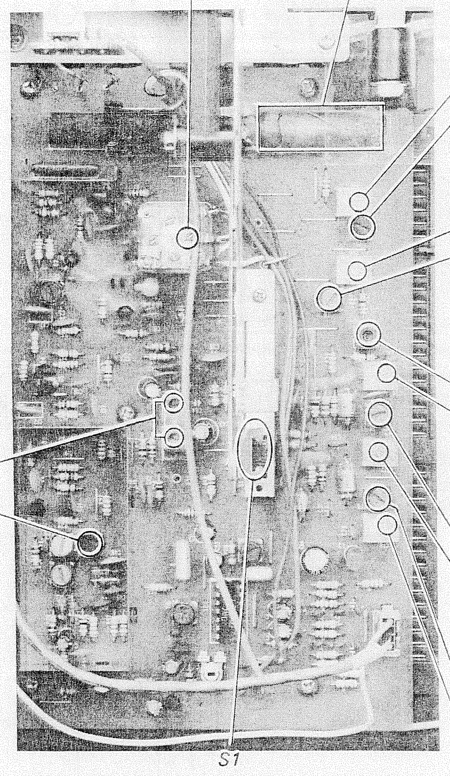


AM SECTION


AM rf signal generator
Put the lead-wire antenna close to the set.
30% amplitude modulation by 400 Hz signal


VOM ①
(range: 0.5–5 V ac)
set
EXT SP

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.



MW TRACKING ADJUSTMENT

Adjust for a maximum reading on VOM ①.

1400 kHz	620 kHz
CT3	ANT 2

SW2 TRACKING ADJUSTMENT

Adjust for a maximum reading on VOM ①.

CT5	18.4 MHz
T9	5.8 MHz

SW1 TRACKING ADJUSTMENT

Adjust for a maximum reading on VOM ①.

CT8	6.3 MHz
T12	2.2 MHz

SW2 FREQUENCY COVERAGE ADJUSTMENT

Adjust for a maximum reading on VOM ①.

T7	5.8 MHz
CT6	18.4 MHz

SW1 FREQUENCY COVERAGE ADJUSTMENT

Adjust for a maximum reading on VOM ①.

T8	2.3 MHz
CT7	6.3 MHz

MW FREQUENCY COVERAGE ADJUSTMENT

Adjust for a maximum reading on VOM ①.

T5	520 kHz
CT4	1680 kHz

AM IF ALIGNMENT

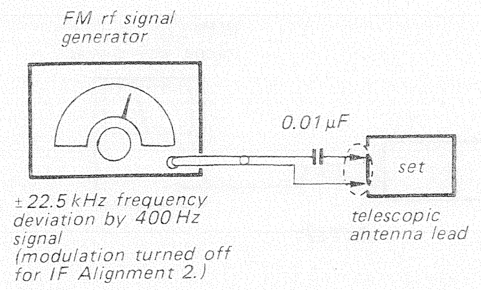
Adjust for a maximum reading on VOM ①.

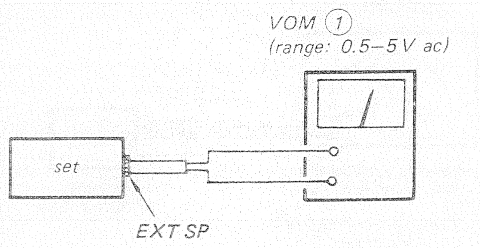
455 kHz	T6
	T4

BAND SELECT

FM
↓
SW2
↓
SW1
↓
MW

FM SECTION


FM rf signal generator
0.01 μF
set
±22.5 kHz frequency deviation by 400 Hz signal (modulation turned off for IF Alignment 2.)
telescopic antenna lead


VOM ①
(range: 0.5–5 V ac)
set
EXT SP

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.
- Connect a jumper wire as shown in Fig. 1.

FM TRACKING ADJUSTMENT

Adjust for a maximum reading on VOM ①.

87.1 MHz	108.5 MHz
L2	CT1

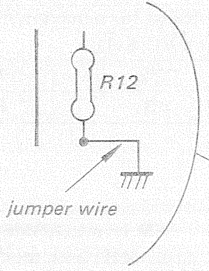
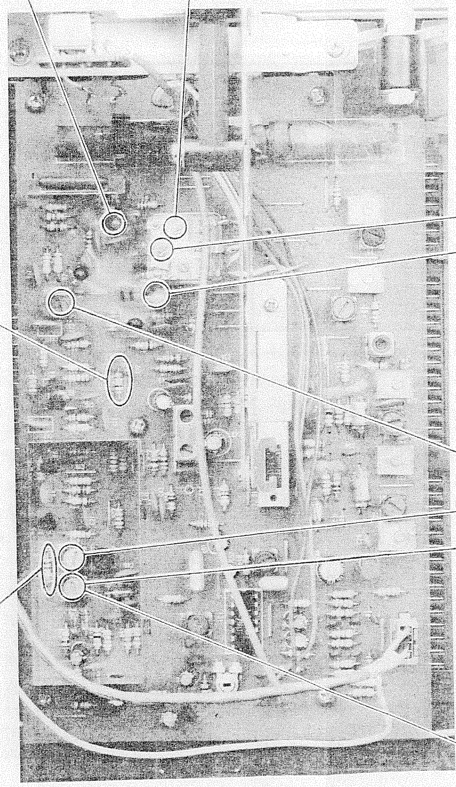

R12
jumper wire

Fig. 1



FM FREQUENCY COVERAGE ADJUSTMENT

Adjust for a maximum reading on VOM ①.

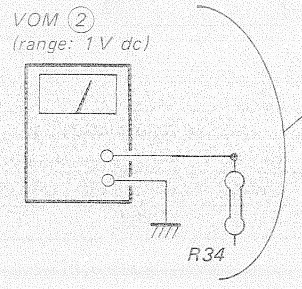
CT2	108.5 MHz
L3	87.1 MHz

FM IF ALIGNMENT 1

(10.7 MHz with modulation)

Adjust for a maximum reading on VOM ①.

T1
T2
T3


VOM ②
(range: 1 V dc)
R34

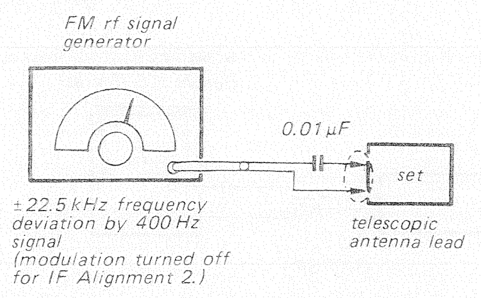
FM IF ALIGNMENT 2

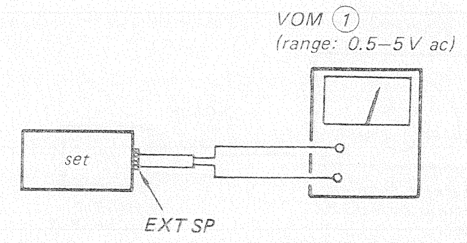
(10.7 MHz with no modulation)

Adjust for 0V reading on VOM ②.

T3

FM SECTION


FM rf signal generator
0.01 μF
set
±22.5 kHz frequency deviation by 400 Hz signal (modulation turned off for IF Alignment 2.)
telescopic antenna lead


VOM ①
(range: 0.5–5 V ac)
set
EXT SP

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.
- Connect a jumper wire as shown in Fig. 1.

FM TRACKING ADJUSTMENT

Adjust for a maximum reading on VOM ①.

87.1 MHz	108.5 MHz
L2	CT1

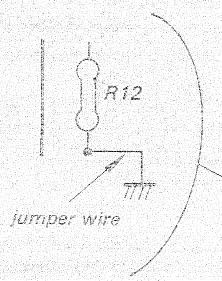
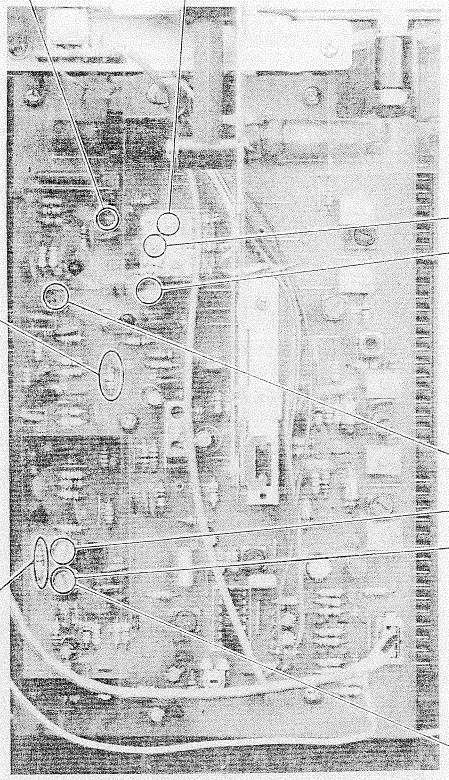

R12
jumper wire

Fig. 1



FM FREQUENCY COVERAGE ADJUSTMENT

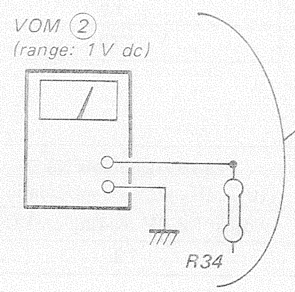
Adjust for a maximum reading on VOM ①.

CT2	108.5 MHz
L3	87.1 MHz

FM IF ALIGNMENT 1
(10.7 MHz with modulation)

Adjust for a maximum reading on VOM ①.

T1
T2
T3


VOM ②
(range: 1 V dc)
R34

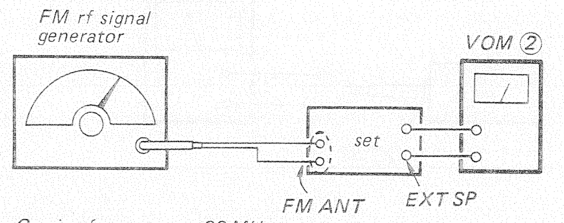
FM IF ALIGNMENT 2
(10.7 MHz with no modulation)

Adjust for 0V reading on VOM ②.

T3

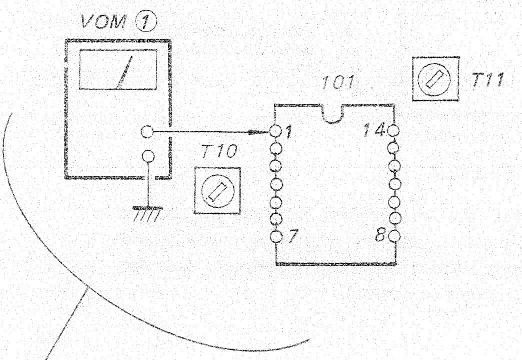
19 kHz Adjustment

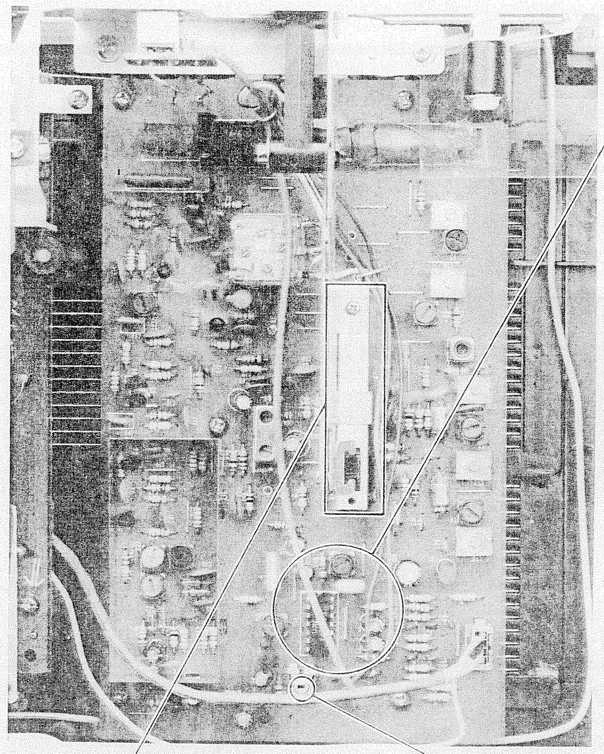
Procedure:


FM rf signal generator
VOM ②
set
FM ANT
EXT SP

Carrier frequency:	98 MHz
Modulation:	400 Hz, 75 kHz deviation (100%)
Output level:	1 mV (60 dB)

1. Adjust T10 for the maximum VOM ① reading.
2. Adjust T11 for the maximum VOM ② reading for both channels.

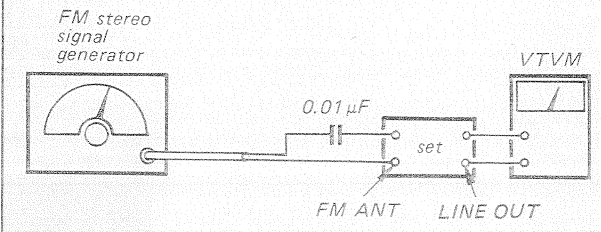

VOM ①
101
T11
T10
1
14
7
8



BAND SELECT
FM
↓
SW2
↓
SW1
↓
MW

FM Stereo Separation Adjustment

Procedure:


FM stereo signal generator
VTVM
0.01 μF
set
FM ANT
LINE OUT

Carrier frequency:	98 MHz
Output level:	1 mV (60 dB)
Mode:	Stereo
Modulation:	
Audio (400 Hz):	67.5 kHz deviation (90%)
Pilpt (19 kHz):	7.5 kHz deviation (10%)

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RV1 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RV1 for minimum re reading.

L-CH Stereo separation: Ⓐ – Ⓑ
R-CH Stereo separation: Ⓒ – Ⓓ

The difference between separations of both channels should be equal.

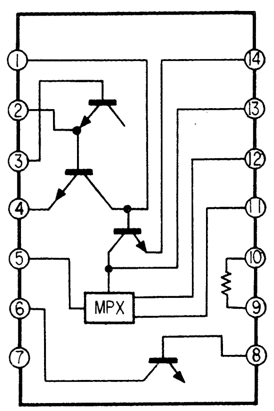
SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM (Radio Section)

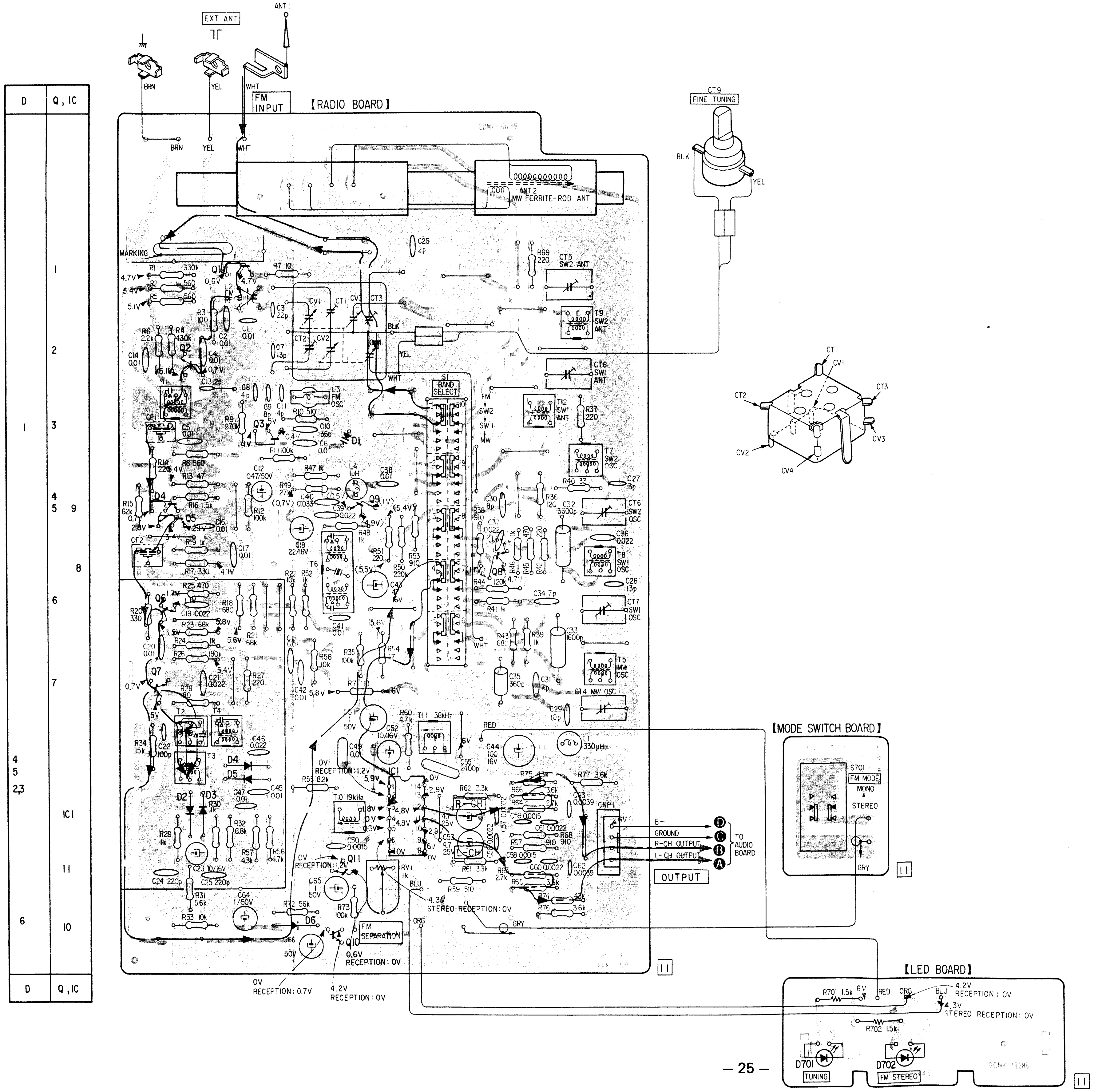
– Conductor and Component Sides –

– Cond

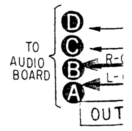
IC1



IC1
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
⑭
MPX

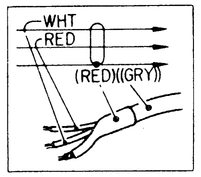


D
Q, IC
ANT I
EXT ANT
BRN
YEL
WHT
FM INPUT
【RADIO BOARD】
ANT 2
MW FERRITE-ROD ANT
CT9
FINE TUNING
BLK
YEL
MARKING
R1 330k
Q1
4.7V
5.4V
5.1V
0.6V
R7 10
C26 2p
R69 220
CT5 SW2 ANT
T9 SW2 ANT
CV1
CT1
CV3
CT3
CT2
CV2
C3 22p
C7 13p
R3 100
C2 0.01
C1 0.01
R6 2.2k
R4 430k
Q2
C14 0.01
C4 0.01
C13 2p
C8 4p
C9 8p
C11 4p
L3 FM OSC
R10 510
C10 36p
C6 0.01
D1
CF1
C5 0.01
R9 270
Q3
P11 100k
S1 BAND SELECT
FM
SW2
SW1
MW
CT8 SW1 ANT
T12 SW1 ANT
R37 220
T7 SW2 OSC
R40 33
C27 3p
CT6 SW2 OSC
C36 0.022
T8 SW1 OSC
C28 13p
CT7 SW1 OSC
T5 MW OSC
CT4 MW OSC
R14 22k
R8 560
R13 47
C12 0.47/50V
R49 27k
R47 1k
L4 1µH
C38 0.01
R15 62k
Q4
R16 1.5k
C40 0.033
Q9
R12 100k
Q5
C16 0.01
R48 1k
C18 22/16V
CF2
R18
R17 330
C17 0.01
T6
R51 220
R50 220
R53 910
C43
C30 8p
R38 910
C37 0.022
R36 120
C32 3600p
Q8
R44 120k
R41 1k
C34 7p
R25 470
Q6
R20 330
C19 0.022
R23 68k
R24
R26 180k
R18 680
R21 68k
R22 10k
R52
C41 0.01
R58 10k
R35 100k
R43 680
R39 1k
C33 1600p
C35 360p
C31 7p
C29 10p
C20 0.01
Q7
R28 180
C21 0.022
R27 220
C42 0.01
R60 4.7k
T11 38kHz
C52 10/16V
RED
C44 100 16V
C55 2400p
L1 330µH
T2
T4
R34 15k
C22 100p
T3
C46 0.022
D4
D5
C47 0.01
C45 0.01
D2
D3
R30 1k
R55 8.2k
T10 19kHz
IC1
R62 3.3k
R75
R77 3.6k
C63 0.0039
CNP1
R29 1k
R32 6.8k
R57 43k
R56 4.7k
C23 10/16V
C24 220p
C25 220p
R31 5.6k
R33 10k
C64 1/50V
C50 0.0015
Q11
C65 50V
RV1 1k
BLU
R59 510
R61 3.3k
C58 0.0015
C60 0.0022
R68 910
C62 0.0039
R72 56k
R73 100k
D6
Q10
FM SEPARATION
C66 50V
ORG
GRY
4.3V STEREO RECEPTION : 0V
0.6V RECEPTION : 0V
0V RECEPTION : 0.7V
4.2V RECEPTION : 0V
0V RECEPTION : 1.2V
B+
GROUND
R-CH OUTPUT
L-CH OUTPUT
OUTPUT
Ⓓ
Ⓒ
Ⓑ
Ⓐ
TO AUDIO BOARD
【MODE SWITCH BOARD】
S701 FM MODE
MONO
STEREO
GRY
【LED BOARD】
R701 1.5k
6V
RED
ORG
BLU
4.2V RECEPTION : 0V
4.3V STEREO RECEPTION : 0V
R702 1.5k
D701 TUNING
D702 FM STEREO
CT1
CV1
CT2
CT3
CV2
CV3
CV4



TO AUDIO BOARD
Ⓓ
Ⓒ
Ⓑ
Ⓐ
OUT

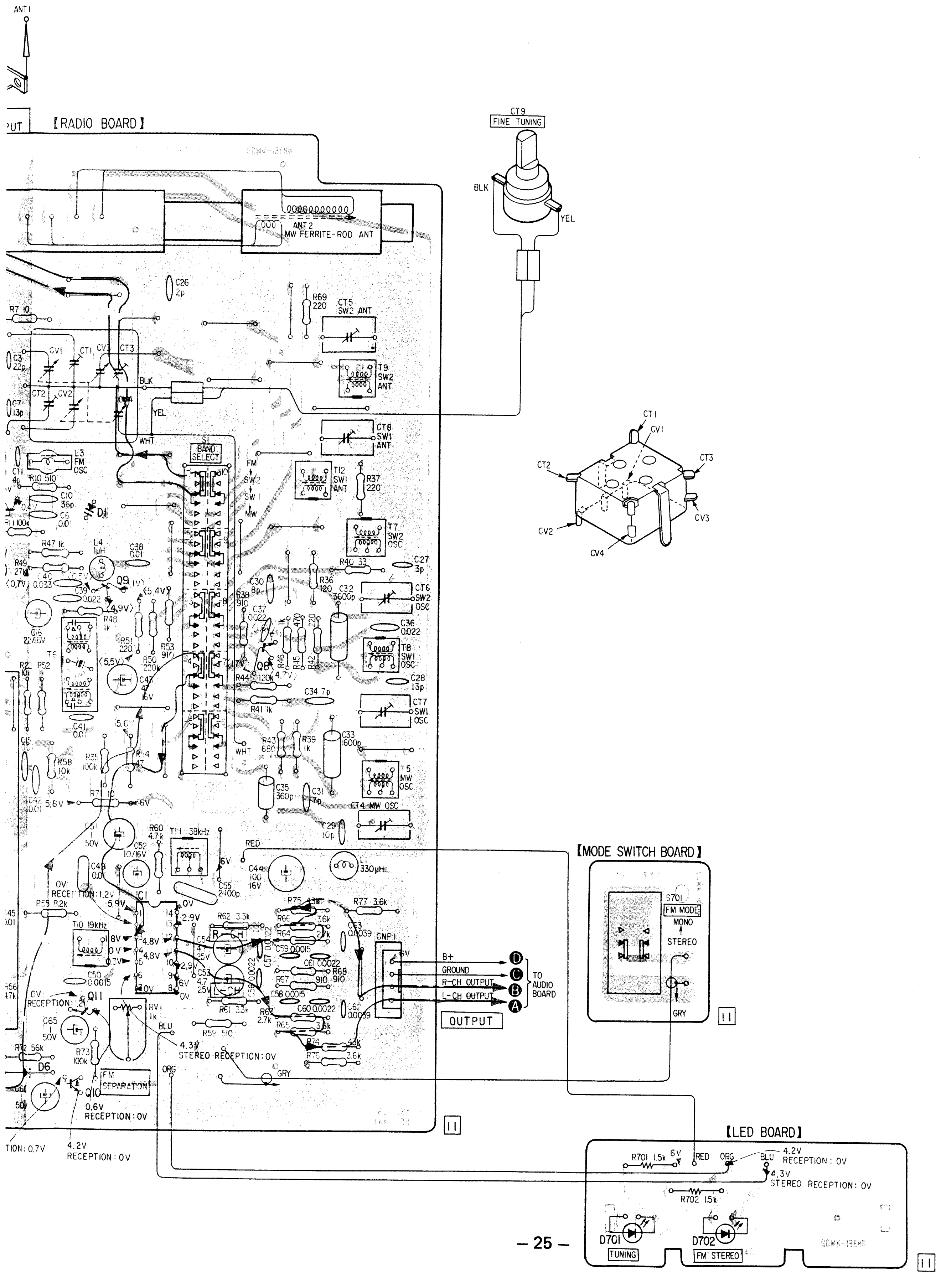
- Color code of sleeving over the end of the jacket.



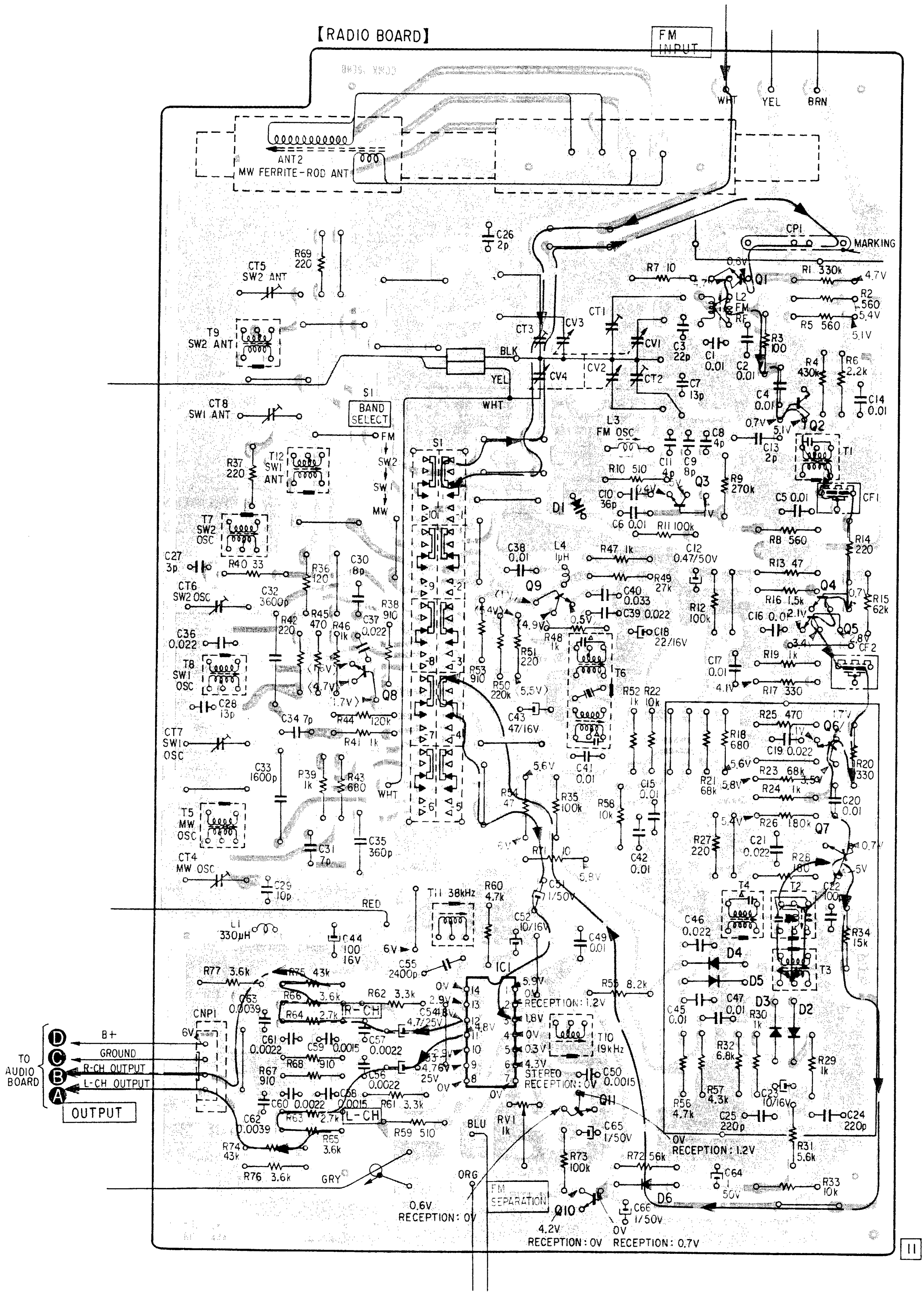
WHT
RED
(RED)(GRY)

- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- [ ]← : indicates side identified with part number.
- : B + pattern
- : signal path
- : L-CH signal path
- : R-CH signal path

:tion)

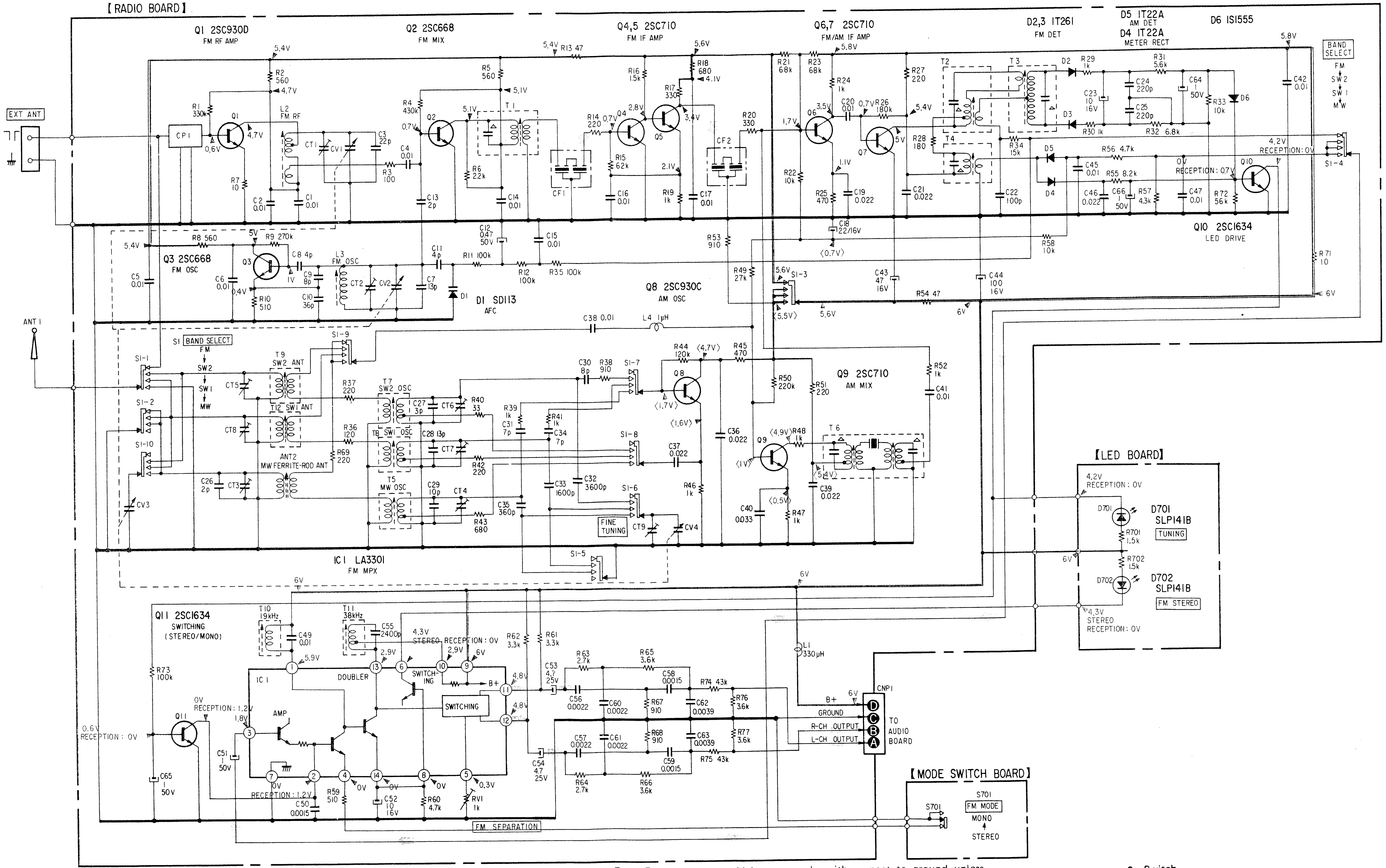

ANT1
[RADIO BOARD]
ANT2
MW FERRITE-ROD ANT
CT9
FINE TUNING
BLK
YEL
WHT
S1
BAND SELECT
FM
SW2
SW1
MW
CT5 SW2 ANT
T9 SW2 ANT
CT8 SW1 ANT
T12 SW1 ANT
T7 SW2 OSC
CT6 SW2 OSC
T8 SW1 OSC
CT7 SW1 OSC
T5 MW OSC
CT4 MW OSC
L3 FM OSC
T11 38kHz
T10 19kHz
IC1
Q9
Q8
Q10
Q11
D1
D6
R-CH
L-CH
CNP1
B+
GROUND
R-CH OUTPUT
L-CH OUTPUT
TO AUDIO BOARD
OUTPUT
RED
BLU
ORG
GRY
FM SEPARATION
STEREO RECEPTION: 0V
0.6V RECEPTION: 0V
4.2V RECEPTION: 0V
CT1
CV1
CT2
CT3
CV2
CV3
CV4
[MODE SWITCH BOARD]
S701
FM MODE
MONO
STEREO
[LED BOARD]
R701 1.5k
R702 1.5k
4.2V RECEPTION: 0V
4.3V STEREO RECEPTION: 0V
D701
TUNING
D702
FM STEREO
11

– Conductor Side –


[RADIO BOARD]
FM INPUT
WHT
YEL
BRN
ANT2
MW FERRITE-ROD ANT
MARKING
CP1
CF1
CF2
T1
T2
T3
T4
T6
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
D1
D2
D3
D4
D5
D6
S1
BAND SELECT
T9 SW2 ANT
CT5 SW2 ANT
CT8 SW1 ANT
T12 SW1 ANT
T7 SW2 OSC
CT6 SW2 OSC
T8 SW1 OSC
CT7 SW1 OSC
T5 MW OSC
CT4 MW OSC
L3 FM OSC
T11 38kHz
T10 19kHz
IC1
R-CH
L-CH
CNP1
B+
GROUND
R-CH OUTPUT
L-CH OUTPUT
TO AUDIO BOARD
OUTPUT
RED
BLU
ORG
GRY
FM SEPARATION
0.6V RECEPTION: 0V
4.2V RECEPTION: 0V
0V RECEPTION: 0.7V
0V RECEPTION: 1.2V
STEREO RECEPTION: 0V
11

Q, IC	D
1	
2	
3	1
9,4	
5	
8	
6	
7	
	4
	5
IC1	3,2
11	
10	6
Q, IC	D

4-2. SCHEMATIC DIAGRAM (Radio Section)


[RADIO BOARD]
Q1 2SC930D
FM RF AMP
Q2 2SC668
FM MIX
Q4,5 2SC710
FM IF AMP
Q6,7 2SC710
FM/AM IF AMP
D2,3 1T261
FM DET
D5 1T22A
AM DET
D4 1T22A
METER RECT
D6 1S1555
BAND SELECT
FM
SW2
SW1
MW
EXT ANT
CP1
L2 FM RF
CT1
CV1
T1
CF1
CF2
T2
T3
T4
Q10 2SC1634
LED DRIVE
Q3 2SC668
FM OSC
L3 FM OSC
CT2
CV2
D1 SD113
AFC
Q8 2SC930C
AM OSC
C38 0.01
L4 1μH
ANT1
S1 BAND SELECT
S1-1
S1-2
S1-3
S1-4
S1-5
S1-6
S1-7
S1-8
S1-9
S1-10
T9 SW2 ANT
T12 SW1 ANT
T7 SW2 OSC
T8 SW1 OSC
T5 MW OSC
ANT2 MW FERRITE-ROD ANT
CT3
CT4
CT5
CT6
CT7
CT8
CT9
CV3
CV4
FINE TUNING
Q9 2SC710
AM MIX
T6
IC1 LA3301
FM MPX
Q11 2SC1634
SWITCHING (STEREO/MONO)
T10 19kHz
T11 38kHz
DOUBLER
SWITCHING
AMP
B+
FM SEPARATION
L1 330μH
CNP1
GROUND
R-CH OUTPUT
L-CH OUTPUT
TO AUDIO BOARD
[LED BOARD]
D701 SLP141B
TUNING
D702 SLP141B
FM STEREO
4.2V RECEPTION: 0V
4.3V STEREO RECEPTION: 0V
[MODE SWITCH BOARD]
S701 FM MODE
MONO
STEREO

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- △ : internal component.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- ——: B+ bus.

- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under detuned conditions with a VOM (20 kΩ/V).
  no mark : FM
  < > : AM
- Voltage variations may be noted due to normal production tolerances.

- Switch

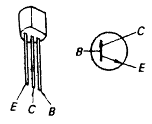
Ref. No.	Switch	Position
S1	BAND SELECT	FM
S701	FM MODE	STEREO

– Radio Section –

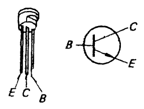
Replacement Semiconductors

For replacement, use semiconductors except in ( ).

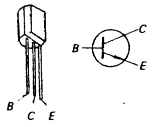
Q1: 2SC930 (2SC930D)
Q8: 2SC930 (2SC930C)



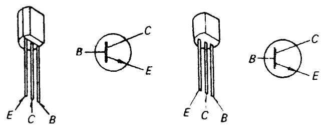
Q2, 3: 2SC668



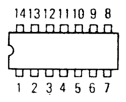
Q4, 9: 2SC710-14 (2SC710)
Q5-7: 2SC710-13 (2SC710)



Q10, 11: 2SC1364 (2SC1634)

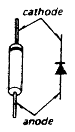

E
C
B
B
C
E
E
C
B
B
C
E

IC1: LA3301

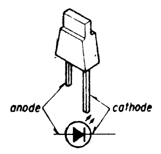

14 13 12 11 10 9 8
1 2 3 4 5 6 7

(Top view)

D1: 1S2687S-1 (SD113)
D2, 3: 1T261
D4, 5: 1T22AM (1T22A)
D6: 1S1555


cathode
anode

D701, 702: SLP141B


anode
cathode

tion
M
REO

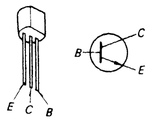
– Audio Amplifier Section –

Replacement Semiconductors

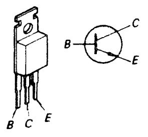
For replacement, use semiconductors except in ( ).

Q101, 103
Q201, 203 } : 2SC1362 (2SC1361)
Q301, 302

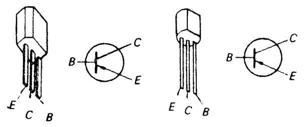
Q102
Q104~106
Q202
Q204~206
Q303~307 } : 2SC1364 (2SC1363)
Q309, 311
Q602~604
Q606~608



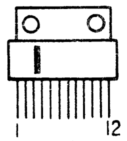
Q308, 605 }: 2SC1173
Q901



Q310, 601: 2SA1027R (2SA733)

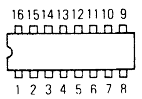

E
C
B
B
C
E
E
C
B
B
C
E

IC301 : HA1377A



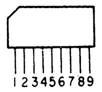
Marking side view

IC501, 502 } : LB1405 (LB1405S)
IC511, 512
IC603: MSM4027 (MSM4027RS)

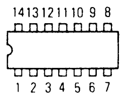

16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8

(Top view)

IC601 : LA3210

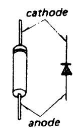


IC602 : TC4001BP
IC604 : TC4011BP (MSM4011RS)
IC605 : TC4081BP (MSM4081RS)

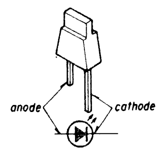

14 13 12 11 10 9 8
1 2 3 4 5 6 7

(Top view)

D601, 603
D604 } : 1S1555 (1T40)
D606~609
D801, 802 } : 10E2
D902
D903 : RD9.1E (RD9.1E-B)

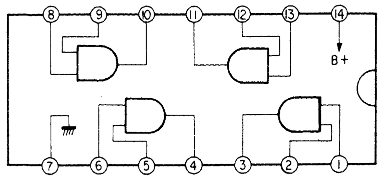

cathode
anode

D521~523 : SLP141B

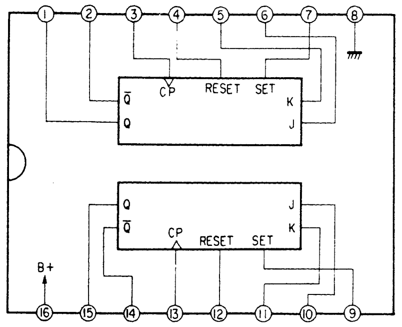

anode
cathode

4-3. MOUNTING DIAGRAM (Audio Amplifier Section)

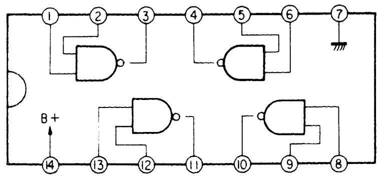
IC605



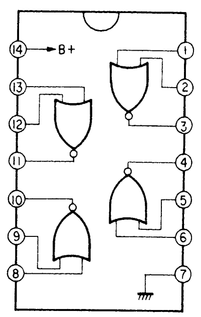
IC603


RESET SET
CP
Q
K
J
B+

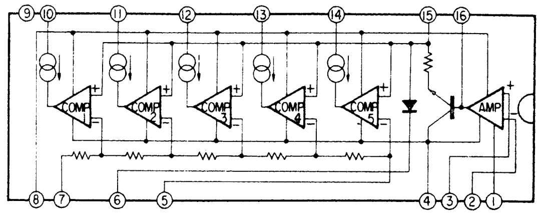
IC604



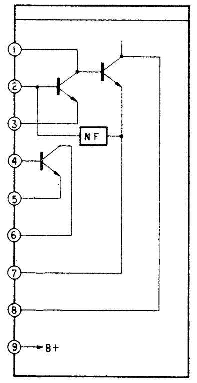
IC602



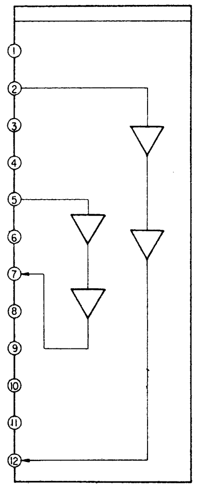
IC501, 502, 511, 512

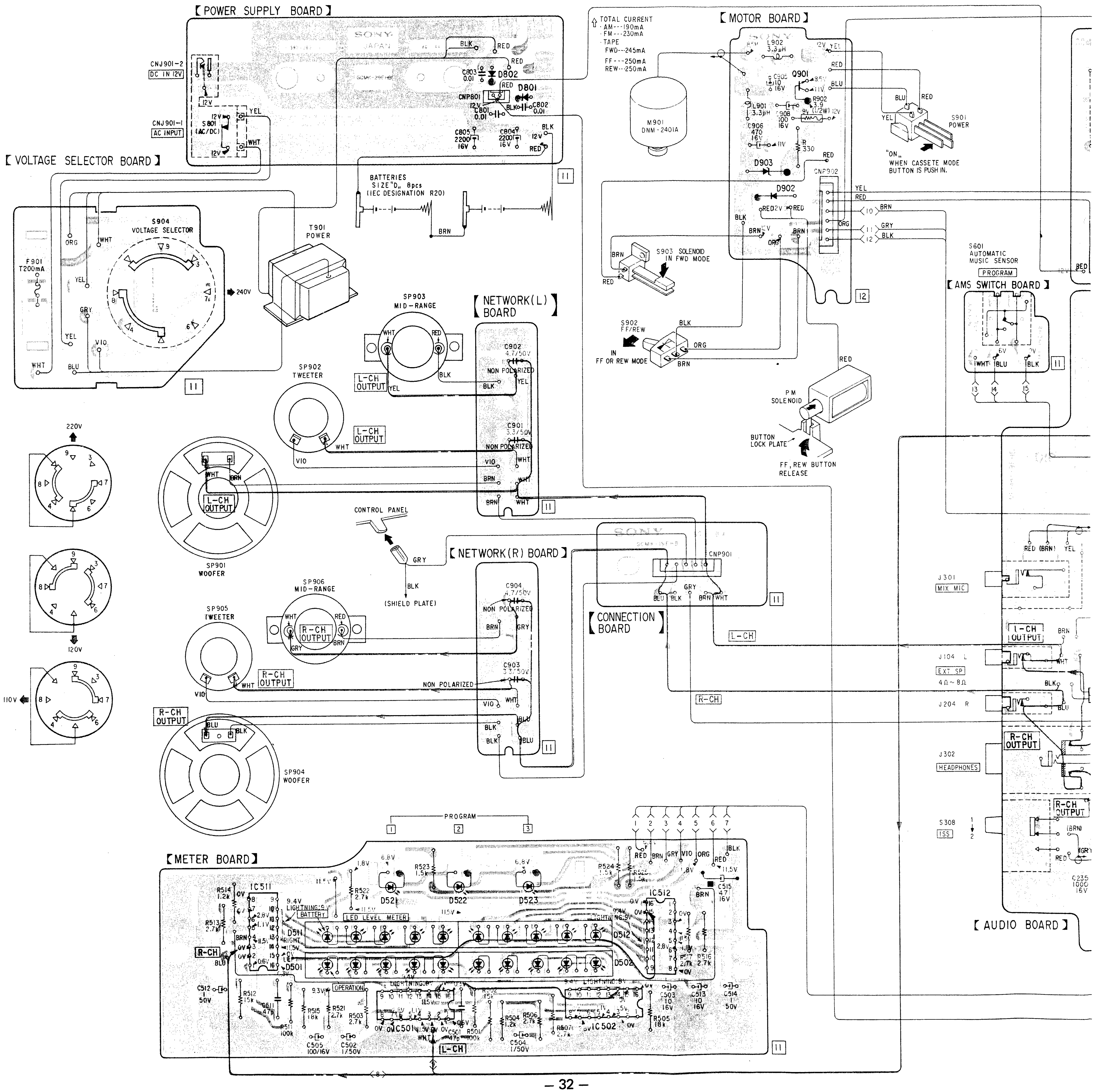


IC601



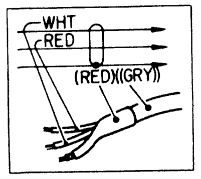
IC301




[POWER SUPPLY BOARD]
CNJ901-2
DC IN 12V
CNJ901-1
AC INPUT
S801 (AC/DC)
D802
D801
CNP801
C803
C801
C802
C805 2200 16V
C804 2200 16V
[VOLTAGE SELECTOR BOARD]
F901 T200mA
S904 VOLTAGE SELECTOR
240V
220V
120V
110V
T901 POWER
BATTERIES SIZE "D", 8pcs (IEC DESIGNATION R20)
SP903 MID-RANGE
SP902 TWEETER
SP901 WOOFER
SP906 MID-RANGE
SP905 TWEETER
SP904 WOOFER
[NETWORK(L) BOARD]
[NETWORK(R) BOARD]
C902 4.7/50V NON POLARIZED
C901 3.3/50V NON POLARIZED
C904 4.7/50V NON POLARIZED
C903 3.3/50V NON POLARIZED
L-CH OUTPUT
R-CH OUTPUT
CONTROL PANEL
(SHIELD PLATE)
TOTAL CURRENT
AM---190mA
FM---230mA
TAPE
FWD---245mA
FF---250mA
REW---250mA
M901 DNM-2401A
[MOTOR BOARD]
L902 3.3μH
Q901
L901 3.3μH
C906 470 16V
D903
D902
CNP902
S901 POWER
"ON" WHEN CASSETE MODE BUTTON IS PUSH IN.
S903 SOLENOID IN FWD MODE
S902 FF/REW
IN FF OR REW MODE
PM SOLENOID
BUTTON LOCK PLATE
FF, REW BUTTON RELEASE
S601 AUTOMATIC MUSIC SENSOR
PROGRAM
[AMS SWITCH BOARD]
CNP901
[CONNECTION BOARD]
L-CH
R-CH
J301 MIX MIC
J104 L EXT SP 4Ω~8Ω
J204 R
J302 HEADPHONES
S308 ISS
C235 1000 16V
[AUDIO BOARD]
PROGRAM
[METER BOARD]
IC511
IC512
LED LEVEL METER
D521
D522
D523
D511
D501
D512
D502
OPERATION
IC501
IC502
LIGHTNING
BATTERY
R-CH
L-CH
C512 50V
C505 100/16V
C502 1/50V
C504 1/50V
C503 10 16V
C513 10 16V
C514 1 50V
C515 47 16V

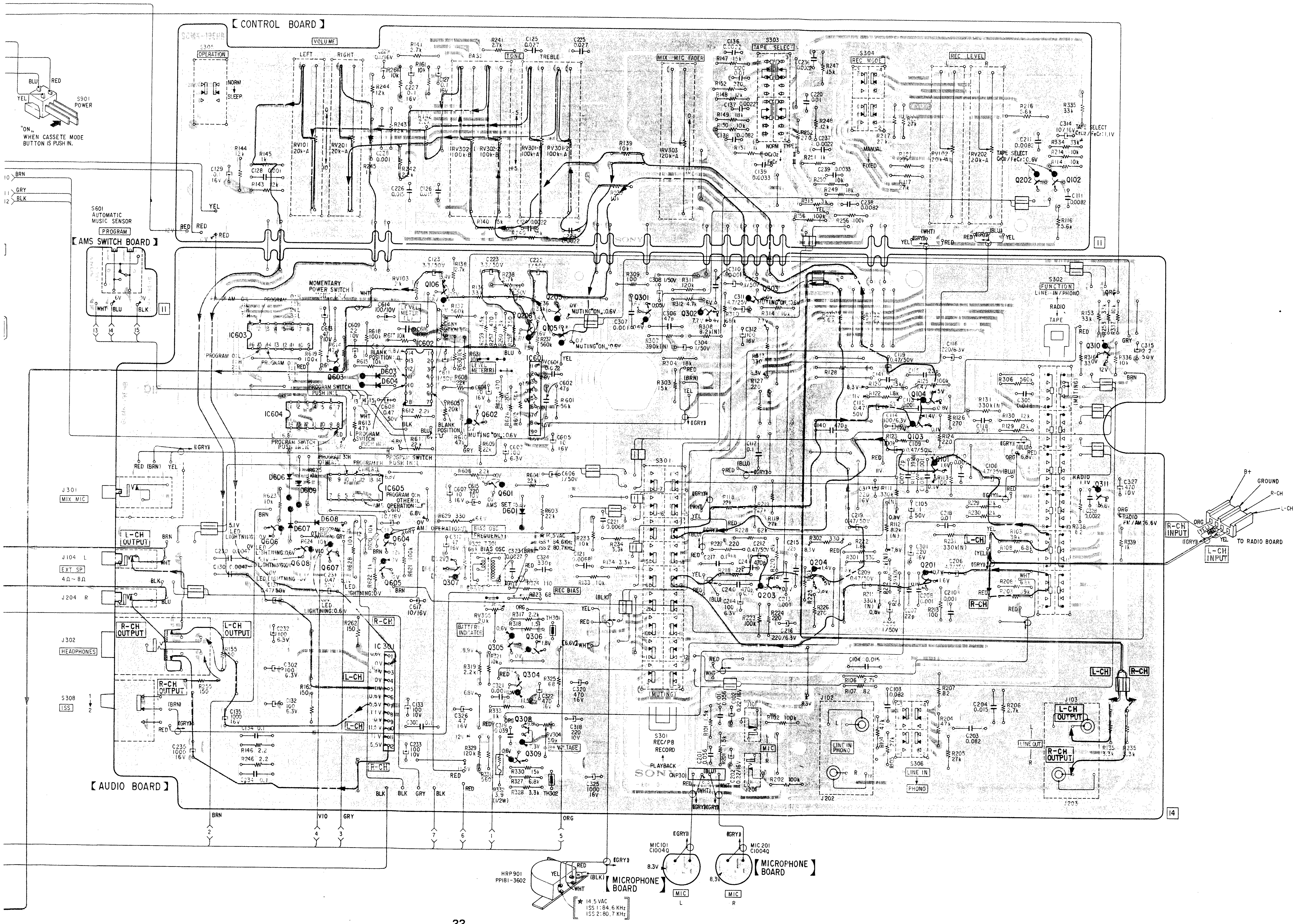
Note:

- Color code of sleeving over the end of the jacket.


WHT
RED
(RED)(GRY)

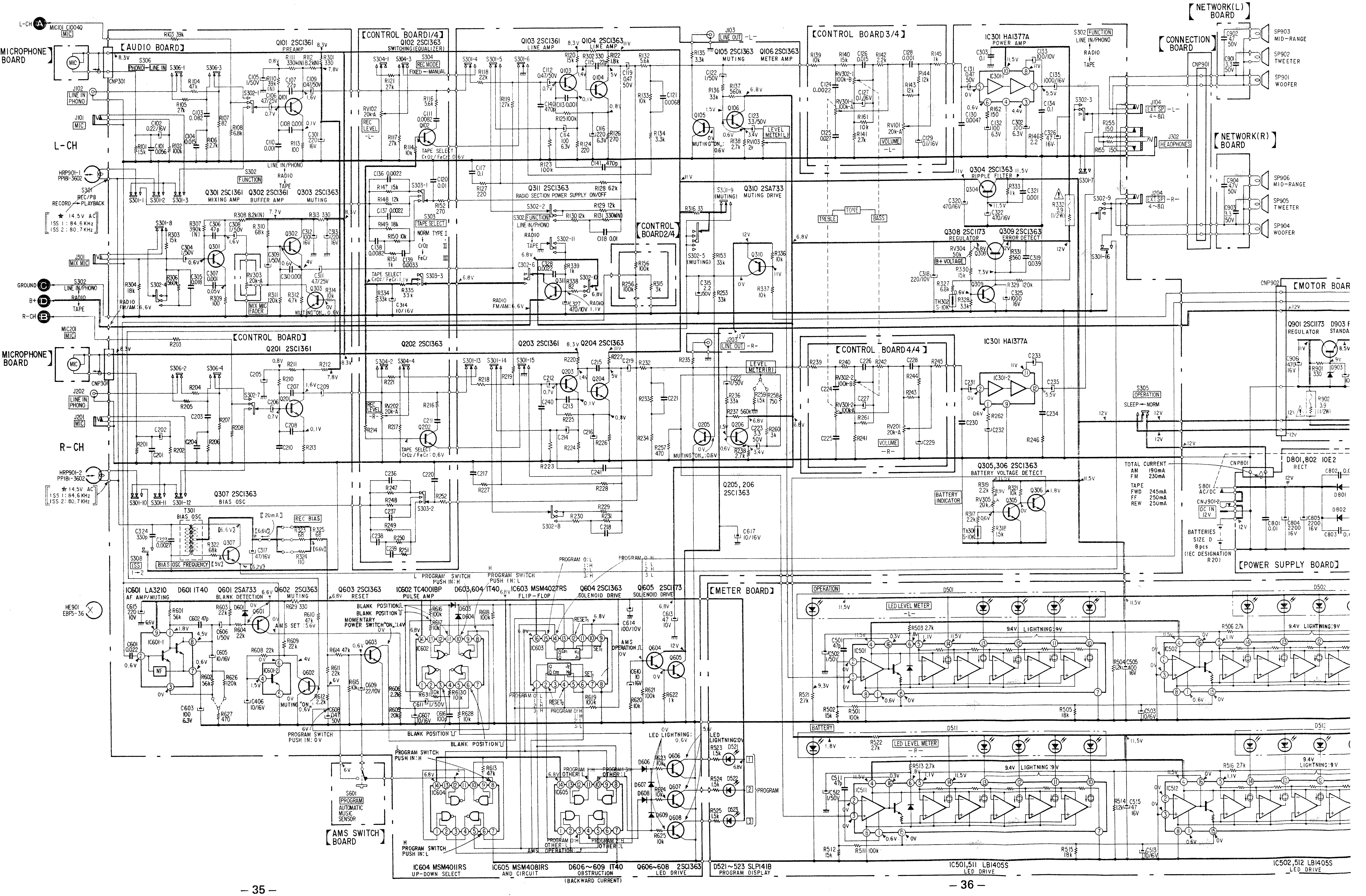
- ○—: parts extracted from the component side.
- ●—: parts extracted from the conductor side.
- ■ : part mounted on the conductor side.

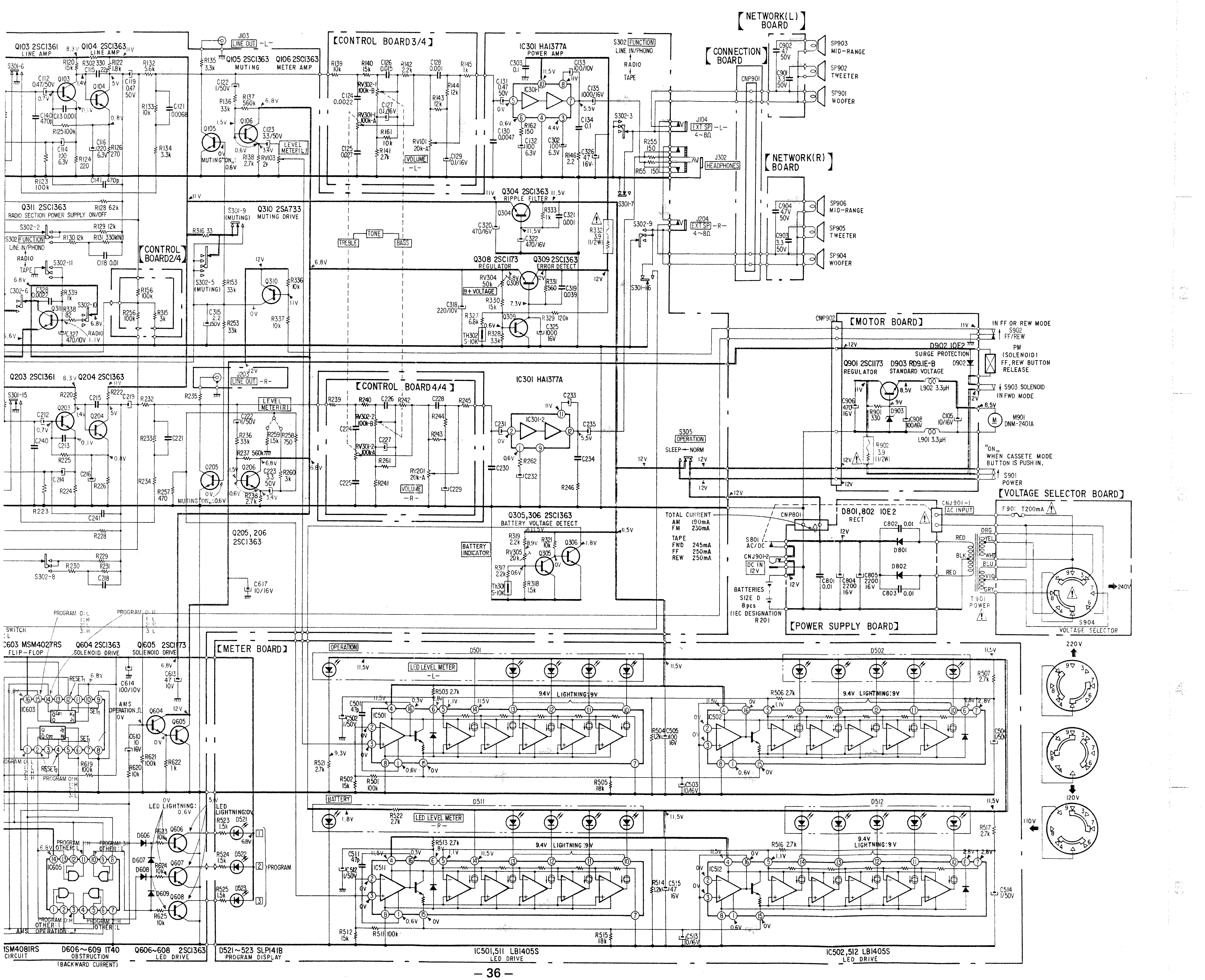
- ▨ : B+ pattern
- ▬▶▬ : signal path
- ▬▶ : L-CH signal path
- ▬▶ : R-CH signal path


[CONTROL BOARD]
[AMS SWITCH BOARD]
[AUDIO BOARD]
[MICROPHONE BOARD]
[MICROPHONE BOARD]
S901 POWER
"ON" WHEN CASSETE MODE BUTTON IS PUSH IN.
S601 AUTOMATIC MUSIC SENSOR
PROGRAM
S301 OPERATION
NORM
SLEEP
VOLUME
LEFT
RIGHT
TONE
BASS
TREBLE
MIX MIC FADER
S303 TAPE SELECT
S304 REC MODE
REC LEVEL
RV101 20k-A
RV201 20k-A
RV302-1 100k-B
RV302-2 100k-B
RV301-1 100k-A
RV301-2 100k-A
RV303 120k-A
RV102 20k-A
RV202 20k-A
TAPE SELECT CrO2/FeCr:0.6V
Q202
Q102
MOMENTARY POWER SWITCH
IC603
IC602
IC604
IC605
IC601
LEVEL METER
BLANK POSITION
PROGRAM SWITCH PUSH IN:L
AMS SET
D601
D603
D604
D606
D607
D608
D609
Q106
Q105
Q200
Q205
Q301
Q302
Q303
Q310
Q603
Q602
Q601
Q604
Q605
Q606
Q607
Q608
Q104
Q103
Q101
Q311
Q201
Q203
Q204
Q304
Q305
Q306
Q308
Q309
S302 FUNCTION LINE-IN/PHONO
RADIO
TAPE
MUTING ON:0.6V
MUTING
BIAS OSC
REC BIAS
BATTERY INDICATOR
IC301
S301 REC/PB RECORD PLAYBACK
CNP301
J301 MIX MIC
J104 L EXT SP 4Ω~8Ω
J204 R
J302 HEADPHONES
S308 ISS
L-CH OUTPUT
R-CH OUTPUT
R-CH INPUT
L-CH INPUT
TO RADIO BOARD
B+
GROUND
R-CH
L-CH
J102
LINE IN PHONO
S306 LINE IN PHONO
J202
J103
J203
LINE OUT
L-CH
R-CH
LED LIGHTNING
HRP901 PP181-3602
★ 14.5 VAC ISS 1:84.6 KHz ISS 2:80.7 KHz
MIC101 C1004Q
MIC201 C1004Q
MIC L
MIC R
8.3V
TH301
TH302
BRN
RED
YEL
BLU
GRY
BLK
WHT
ORG
VIO
11
14

IC , Q	D
901	802 801
	903 902
202 102	
106 303 205 301 206 302 105 IC603 310 IC602	
603 104	603 604
IC604 602	
103 101	
311 601	606 609
	601 608 607
606 604	
608 204 607 201 605 307 203	
306 305 IC301	
304	
308	
309	
IC511 IC512	521 522 523 511 512 501 502
IC501 IC502	
IC , Q	D

4-4. SCHEMATIC DIAGRAM (Audio Amplifier Section)


MICROPHONE BOARD
AUDIO BOARD
L-CH
R-CH
GROUND
B+
R-CH
MIC101 C1004Q
J102 LINE IN PHONO
J101 MIC
HRP901-1 PP181-3602
HRP901-2 PP181-3602
S301 REC/PB RECORD — PLAYBACK
14.5V AC
ISS 1: 84.6KHz
ISS 2: 80.7KHz
J301 MIX MIC
S302 LINE IN/PHONO RADIO TAPE
Q101 2SC1361 PREAMP
Q201 2SC1361
Q301 2SC1361 MIXING AMP
Q302 2SC1361 BUFFER AMP
Q303 2SC1363 MUTING
Q307 2SC1363 BIAS OSC
T301 BIAS OSC
RV303 20k-A MIX MIC FADER
REC BIAS
S308 ISS
BIAS OSC FREQUENCY
CONTROL BOARD(1/4)
CONTROL BOARD
CONTROL BOARD2/4
CONTROL BOARD3/4
CONTROL BOARD4/4
Q102 2SC1363 SWITCHING(EQUALIZER)
Q202 2SC1363
S304 REC MODE FIXED — MANUAL
RV102 20k-A REC LEVEL -L-
RV202 20k-A REC LEVEL -R-
TAPE SELECT CrO2/FeCr: 0.6V
S303 TAPE SELECT NORM TYPE I CrO2 II FeCr III
Q103 2SC1361 LINE AMP
Q104 2SC1363 LINE AMP
Q203 2SC1361
Q204 2SC1363
Q311 2SC1363 RADIO SECTION POWER SUPPLY ON/OFF
S302 FUNCTION LINE IN/PHONO RADIO TAPE
RADIO FM/AM: 6.6V
J103 LINE OUT -L-
J203 LINE OUT -R-
Q105 2SC1363 MUTING
Q106 2SC1363 METER AMP
Q205, 206 2SC1363
LEVEL METER(L)
LEVEL METER(R)
Q310 2SA733 MUTING DRIVE
S301-9 (MUTING)
S302-5 (MUTING)
MUTING "ON": 0.6V
TREBLE
TONE
BASS
RV101 20k-A VOLUME -L-
RV201 20k-A VOLUME -R-
IC301 HA1377A POWER AMP
Q304 2SC1363 RIPPLE FILTER
Q308 2SC1173 REGULATOR
Q309 2SC1363 ERROR DETECT
B+ VOLTAGE
Q305,306 2SC1363 BATTERY VOLTAGE DETECT
BATTERY INDICATOR
S305 OPERATION SLEEP — NORM
J104 EXT SP -L- 4~8Ω
J204 EXT SP -R- 4~8Ω
J302 HEADPHONES
CONNECTION BOARD
NETWORK(L) BOARD
NETWORK(R) BOARD
SP903 MID-RANGE
SP902 TWEETER
SP901 WOOFER
SP906 MID-RANGE
SP905 TWEETER
SP904 WOOFER
MOTOR BOARD
Q901 2SC1173 REGULATOR
D903 STANDA
D801,802 10E2 RECT
S801 AC/DC
CNJ901 DC IN 12V
BATTERIES SIZE D 8pcs (IEC DESIGNATION R20)
POWER SUPPLY BOARD
TOTAL CURRENT
AM 190mA
FM 230mA
TAPE
FWD 245mA
FF 250mA
REW 250mA
HE901 EBF5-36
IC601 LA3210 AF AMP/MUTING
D601 1T40
Q601 2SA733 BLANK DETECTION
Q602 2SC1363 MUTING
Q603 2SC1363 RESET
IC602 TC4001BP PULSE AMP
D603,604 1T40
IC603 MSM4027RS FLIP-FLOP
Q604 2SC1363 SOLENOID DRIVE
Q605 2SC1173 SOLENOID DRIVE
BLANK POSITION
MOMENTARY POWER SWITCH "ON"
AMS SET
AMS OPERATION
PROGRAM SWITCH PUSH IN: H
PROGRAM SWITCH PUSH IN: L
PROGRAM SWITCH PUSH IN: 0V
S601 PROGRAM AUTOMATIC MUSIC SENSOR
AMS SWITCH BOARD
IC604 MSM4011RS UP-DOWN SELECT
IC605 MSM4081RS AND CIRCUIT
D606~609 1T40 OBSTRUCTION (BACKWARD CURRENT)
Q606~608 2SC1363 LED DRIVE
LED LIGHTNING: 0V
D521~523 SLP141B PROGRAM DISPLAY
METER BOARD
OPERATION
BATTERY
LED LEVEL METER -L-
LED LEVEL METER -R-
LIGHTNING: 9V
IC501,511 LB1405S LED DRIVE
IC502,512 LB1405S LED DRIVE


[CONTROL BOARD3/4]
[CONTROL BOARD2/4]
[CONTROL BOARD4/4]
[NETWORK(L) BOARD]
[NETWORK(R) BOARD]
[CONNECTION BOARD]
[MOTOR BOARD]
[POWER SUPPLY BOARD]
[VOLTAGE SELECTOR BOARD]
[METER BOARD]
Q103 2SC1361 LINE AMP
Q104 2SC1363
Q105 2SC1363 MUTING
Q106 2SC1363 METER AMP
Q203 2SC1361
Q204 2SC1363
Q205, 206 2SC1363
Q311 2SC1363 RADIO SECTION POWER SUPPLY ON/OFF
Q310 2SA733 MUTING DRIVE
IC301 HA1377A POWER AMP
Q304 2SC1363 RIPPLE FILTER
Q308 2SC1173 REGULATOR
Q309 2SC1363 ERROR DETECT
Q305,306 2SC1363 BATTERY VOLTAGE DETECT
Q901 2SC1173 REGULATOR
D903 RD9.1E-B STANDARD VOLTAGE
D902 10E2 SURGE PROTECTION
D801,802 10E2 RECT
M901 DNM-2401A
SP901 WOOFER
SP902 TWEETER
SP903 MID-RANGE
SP904 WOOFER
SP905 TWEETER
SP906 MID-RANGE
J103 LINE OUT -L-
J203 LINE OUT -R-
J104 EXT SP -L- 4~8Ω
J204 EXT SP -R- 4~8Ω
J302 HEADPHONES
TREBLE
TONE
BASS
VOLUME -L-
VOLUME -R-
LEVEL METER(L)
LEVEL METER(R)
B+ VOLTAGE
BATTERY INDICATOR
S305 OPERATION SLEEP↔NORM
TOTAL CURRENT AM 190mA FM 230mA TAPE FWD 245mA FF 250mA REW 250mA
BATTERIES SIZE D 8pcs (IEC DESIGNATION R20)
F901 T200mA
T901 POWER
S904 VOLTAGE SELECTOR
220V
120V
110V
240V
IN FF OR REW MODE
S902 FF/REW
PM (SOLENOID) FF,REW BUTTON RELEASE
S903 SOLENOID IN FWD MODE
"ON" WHEN CASSETE MODE BUTTON IS PUSH IN.
S901 POWER
IC603 MSM4027RS FLIP-FLOP
Q604 2SC1363 SOLENOID DRIVE
Q605 2SC1173 SOLENOID DRIVE
IC605 MSM4081RS CIRCUIT
D606~609 1T40 OBSTRUCTION (BACKWARD CURRENT)
Q606~608 2SC1363 LED DRIVE
D521~523 SLP141B PROGRAM DISPLAY
IC501,511 LB1405S LED DRIVE
IC502,512 LB1405S LED DRIVE
OPERATION
BATTERY
LED LEVEL METER -L-
LED LEVEL METER -R-
D501
D502
D511
D512
PROGRAM
LED LIGHTING

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note:

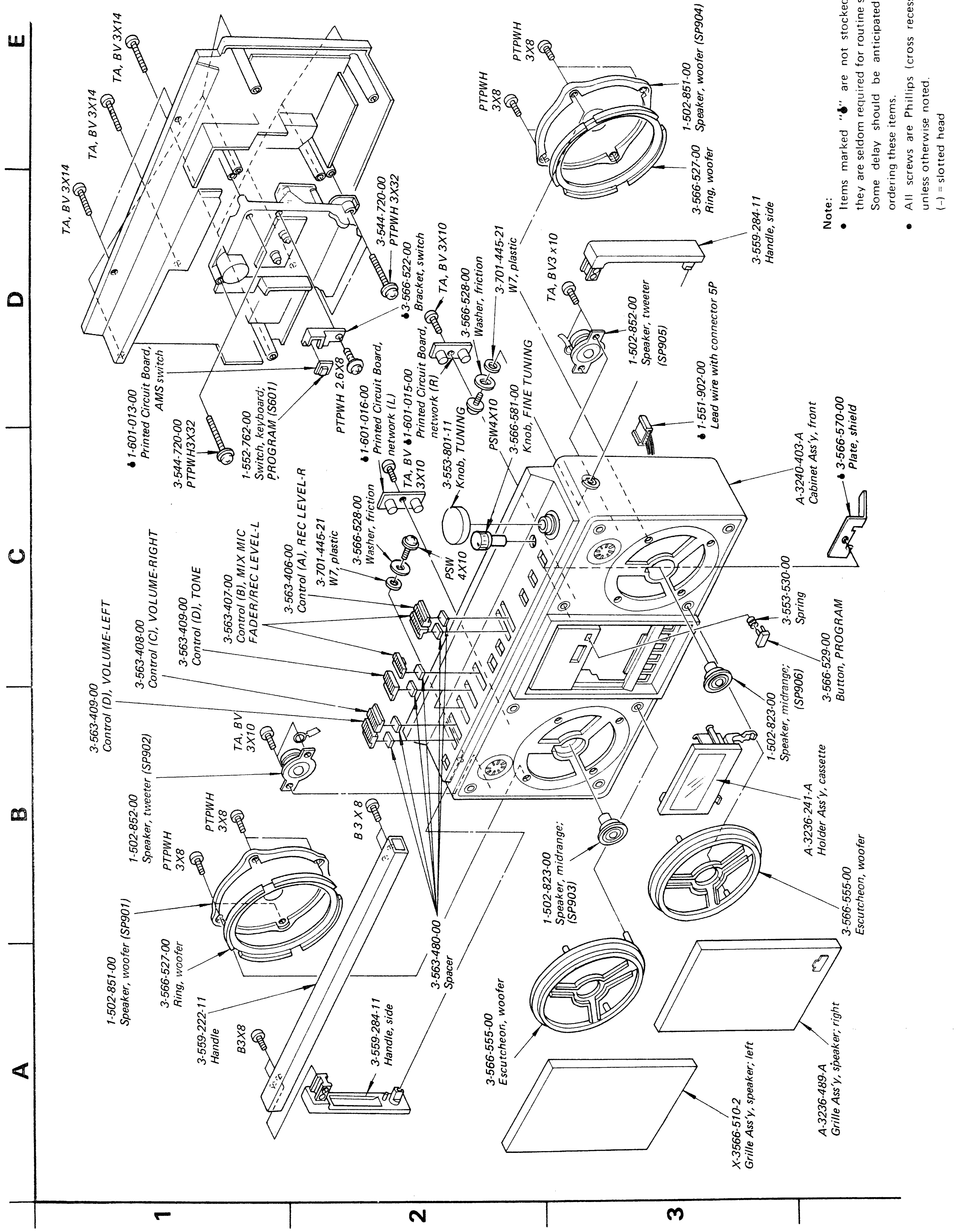
- Components for right channel have same values as for left channel. Reference numbers are coded from **200**.
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼ W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- -▭- : fusible resistor.
- △ : internal component.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- ▬ : B+ bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no signal conditions with a VOM (20 kΩ/V).
  no mark: PLAYBACK
  (( )) : RECORD
- Voltage variations may be noted due to normal production tolerances.
- AC voltage readings in the bias oscillator with a VTVM.
- Total current is measured with no cassette installed.

- Switch

Ref. No.	Switch	Position
S301	REC/PB	PLAYBACK
S302	FUNCTION	RADIO/TV
S303	TAPE SELECT	CrO_2 TYPE II
S304	REC MODE	MANUAL
S305	POWER	ON
S306	LINE IN/PHONO	LINE IN
S308	ISS	1
S601	PROGRAM	–
S801 (included in CNJ801)	AC/DC	–
S901	POWER	ON:WHEN FUNCTION BUTTON IS PRESSED
S902	FF/REW	–
S903	SOLENOID	ON: WHEN FWD BUTTON IS PRESSED
S904	VOLTAGE SELECTOR	240 V

SECTION 5
EXPLODED VIEWS

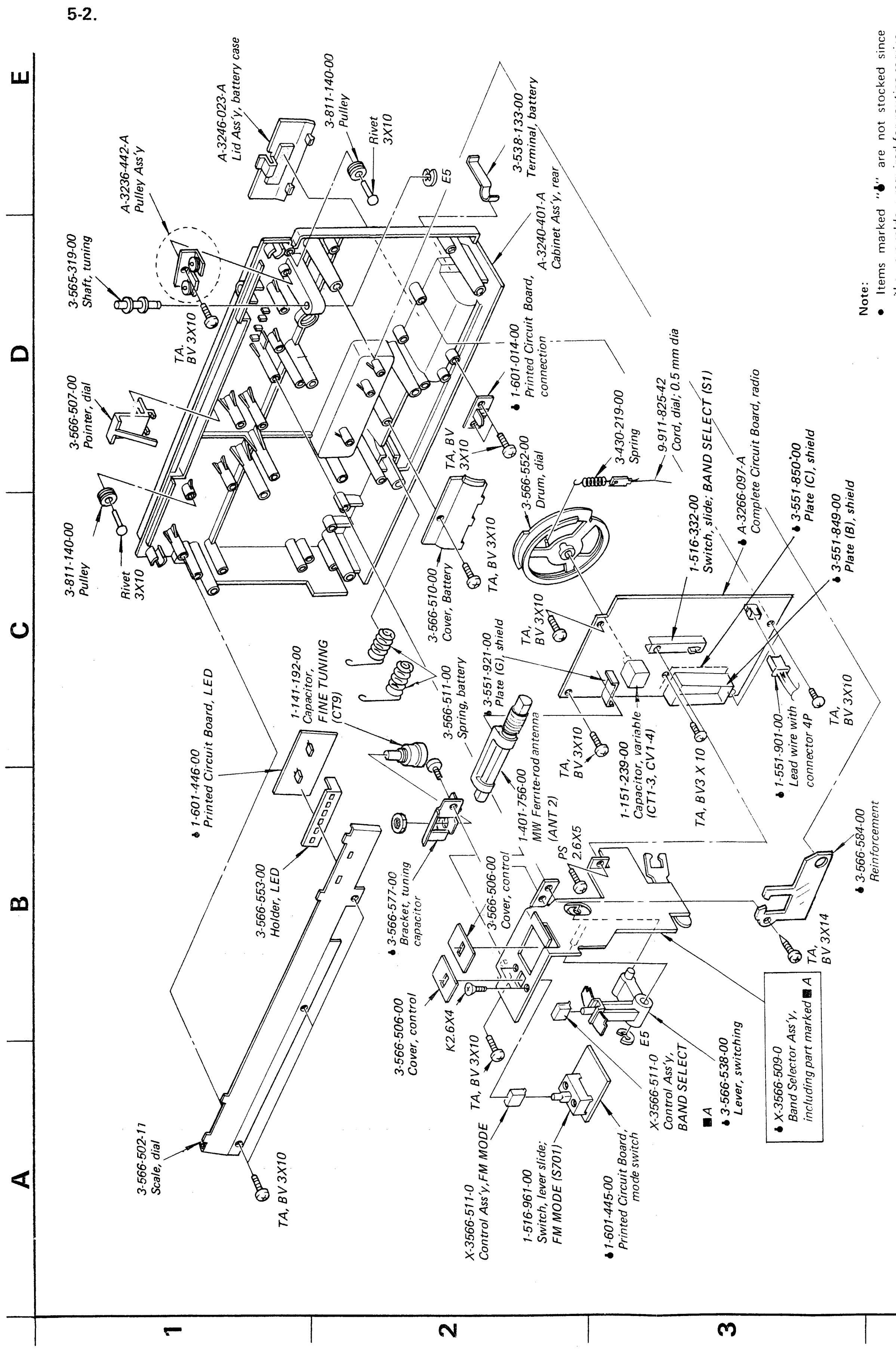
5-1.



TA, BV 3X14
TA, BV 3X14
TA, BV 3X14
TA, BV 3X14
PTPWH 3X8
PTPWH 3X8
1-502-851-00 Speaker, woofer (SP904)
3-566-527-00 Ring, woofer
3-559-284-11 Handle, side
3-544-720-00 PTPWH 3X32
♦3-566-522-00 Bracket, switch
TA, BV 3X10
3-566-528-00 Washer, friction
3-701-445-21 W7, plastic
TA, BV3 x10
1-502-852-00 Speaker, tweeter (SP905)
♦1-551-902-00 Lead wire with connector 5P
A-3240-403-A Cabinet Ass'y, front
♦3-566-570-00 Plate, shield
♦1-601-013-00 Printed Circuit Board, AMS switch
3-544-720-00 PTPWH3X32
1-552-762-00 Switch, keyboard; PROGRAM (S601)
PTPWH 2.6X8
♦1-601-016-00 Printed Circuit Board, network (L)
♦1-601-015-00 Printed Circuit Board, network (R)
TA, BV 3X10
3-553-801-11 Knob, TUNING
PSW4X10
3-566-581-00 Knob, FINE TUNING
3-563-409-00 Control (D), VOLUME-LEFT
3-563-408-00 Control (C), VOLUME-RIGHT
3-563-409-00 Control (D), TONE
3-563-407-00 Control (B), MIX MIC FADER/REC LEVEL-L
3-563-406-00 Control (A), REC LEVEL-R
3-701-445-21 W7, plastic
3-566-528-00 Washer, friction
PSW 4X10
3-553-530-00 Spring
3-566-529-00 Button, PROGRAM
1-502-823-00 Speaker, midrange; (SP906)
TA, BV 3X10
1-502-852-00 Speaker, tweeter (SP902)
PTPWH 3X8
PTPWH 3X8
B 3 X 8
A-3236-241-A Holder Ass'y, cassette
1-502-823-00 Speaker, midrange; (SP903)
3-566-555-00 Escutcheon, woofer
3-566-555-00 Escutcheon, woofer
1-502-851-00 Speaker, woofer (SP901)
3-566-527-00 Ring, woofer
3-559-222-11 Handle
B3X8
3-559-284-11 Handle, side
3-563-480-00 Spacer
A-3236-489-A Grille Ass'y, speaker; right
X-3566-510-2 Grille Ass'y, speaker; left
E
D
C
B
A
1
2
3

Note:
- Items marked "♦" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head

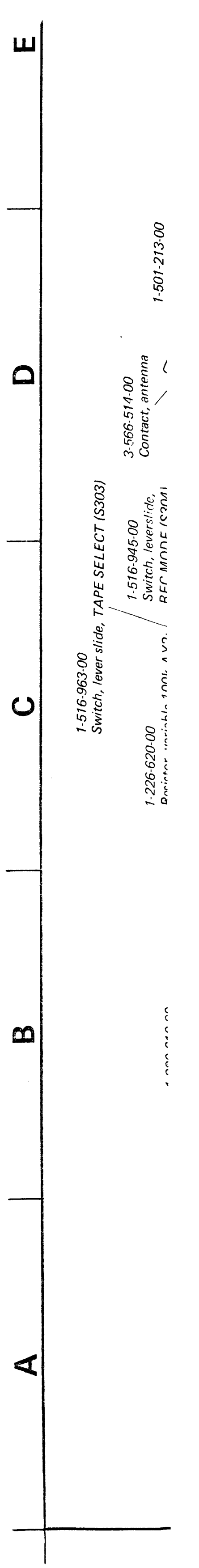
5-2.



A-3246-023-A Lid Ass'y, battery case
3-811-140-00 Pulley
Rivet 3X10
E5
3-538-133-00 Terminal, battery
A-3240-401-A Cabinet Ass'y, rear
A-3236-442-A Pulley Ass'y
3-565-319-00 Shaft, tuning
TA, BV 3X10
3-566-507-00 Pointer, dial
♦1-601-014-00 Printed Circuit Board, connection
TA, BV 3X10
3-566-552-00 Drum, dial
3-430-219-00 Spring
9-911-825-42 Cord, dial, 0.5 mm dia
1-516-332-00 Switch, slide; BAND SELECT (S1)
♦A-3266-097-A Complete Circuit Board, radio
♦3-551-850-00 Plate (C), shield
♦3-551-849-00 Plate (B), shield
3-811-140-00 Pulley
Rivet 3X10
3-566-510-00 Cover, Battery
TA, BV 3X10
TA, BV 3X10
3-566-511-00 Spring, battery
1-141-192-00 Capacitor, FINE TUNING (CT9)
♦3-551-921-00 Plate (G), shield
TA, BV 3X10
♦1-551-901-00 Lead wire with connector 4P
TA, BV 3X10
1-151-239-00 Capacitor, variable (CT1-3, CV1-4)
TA, BV3 X 10
1-401-756-00 MW Ferrite-rod antenna (ANT 2)
♦1-601-446-00 Printed Circuit Board, LED
PS 2.6X5
3-566-506-00 Cover, control
♦3-566-584-00 Reinforcement
TA, BV 3X14
3-566-553-00 Holder, LED
♦3-566-577-00 Bracket, tuning capacitor
3-566-506-00 Cover, control
K2.6X4
TA, BV 3X10
E5
X-3566-511-0 Control Ass'y, BAND SELECT
■A
♦3-566-538-00 Lever, switching
♦X-3566-509-0 Band Selector Ass'y, including part marked ■A
3-566-502-11 Scale, dial
TA, BV 3X10
X-3566-511-0 Control Ass'y,FM MODE
1-516-961-00 Switch, lever slide; FM MODE (S701)
♦1-601-445-00 Printed Circuit Board, mode switch
E
D
C
B
A
1
2
3

Note:
- Items marked "♦" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head

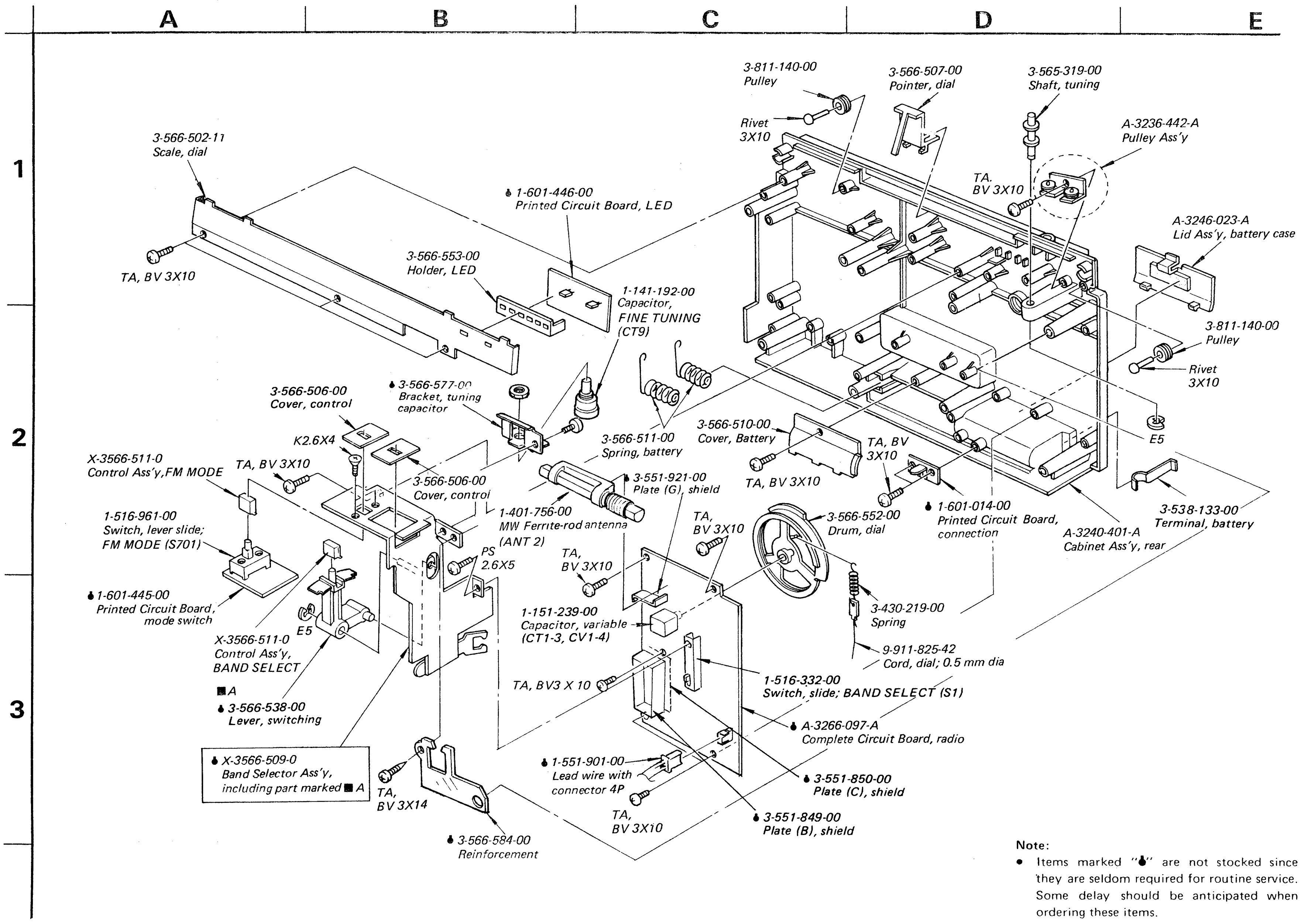
5-3.



1-501-213-00
3-566-514-00 Contact, antenna
1-516-963-00 Switch, lever slide, TAPE SELECT (S303)
1-516-945-00 Switch, leverslide,
1-226-620-00
E
D
C
B
A

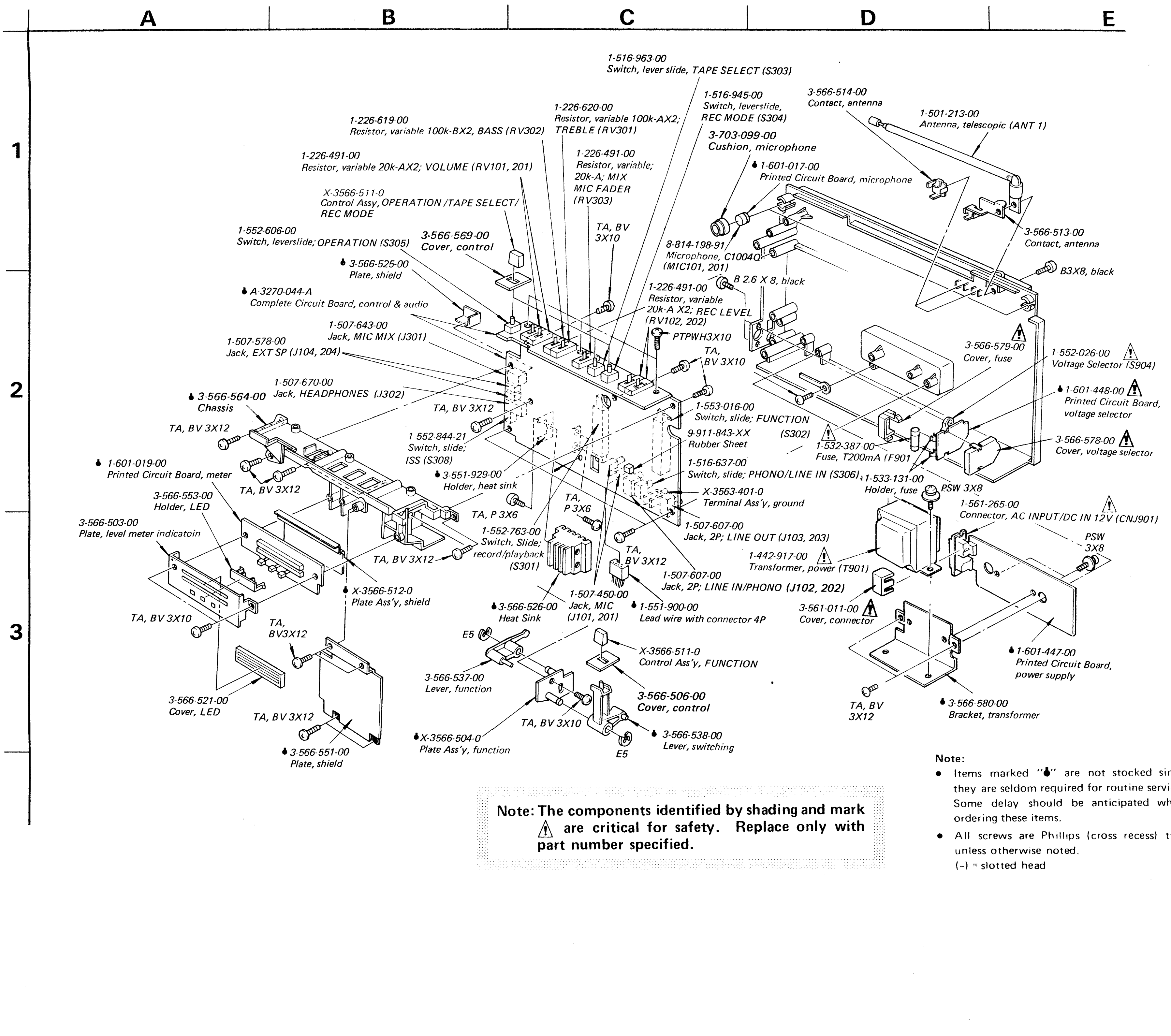
- All screws are Phillips (cross recess) type unless otherwise noted.
(-) = slotted head

5-2.


A
B
C
D
E
1
2
3
3-566-502-11
Scale, dial
TA, BV 3X10
♠ 1-601-446-00
Printed Circuit Board, LED
3-566-553-00
Holder, LED
1-141-192-00
Capacitor,
FINE TUNING
(CT9)
3-811-140-00
Pulley
Rivet
3X10
3-566-507-00
Pointer, dial
3-565-319-00
Shaft, tuning
TA.
BV 3X10
A-3236-442-A
Pulley Ass'y
A-3246-023-A
Lid Ass'y, battery case
3-811-140-00
Pulley
Rivet
3X10
E5
3-538-133-00
Terminal, battery
A-3240-401-A
Cabinet Ass'y, rear
♠ 1-601-014-00
Printed Circuit Board,
connection
TA, BV
3X10
3-566-510-00
Cover, Battery
TA, BV 3X10
3-566-552-00
Drum, dial
3-430-219-00
Spring
9-911-825-42
Cord, dial; 0.5 mm dia
3-566-511-00
Spring, battery
♠ 3-551-921-00
Plate (G), shield
♠ 3-566-577-00
Bracket, tuning
capacitor
3-566-506-00
Cover, control
K2.6X4
3-566-506-00
Cover, control
X-3566-511-0
Control Ass'y,FM MODE
TA, BV 3X10
1-516-961-00
Switch, lever slide;
FM MODE (S701)
♠ 1-601-445-00
Printed Circuit Board,
mode switch
E5
X-3566-511-0
Control Ass'y,
BAND SELECT
■A
♠ 3-566-538-00
Lever, switching
PS
2.6X5
1-401-756-00
MW Ferrite-rod antenna
(ANT 2)
TA,
BV 3X10
TA,
BV 3X10
1-151-239-00
Capacitor, variable
(CT1-3, CV1-4)
TA, BV3 X 10
1-516-332-00
Switch, slide; BAND SELECT (S1)
♠ A-3266-097-A
Complete Circuit Board, radio
♠ 1-551-901-00
Lead wire with
connector 4P
♠ 3-551-850-00
Plate (C), shield
♠ 3-551-849-00
Plate (B), shield
TA,
BV 3X10
♠ X-3566-509-0
Band Selector Ass'y,
including part marked ■ A
TA,
BV 3X14
♠ 3-566-584-00
Reinforcement

Note:
- Items marked "♠" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All screws are Phillips (cross recess) type unless otherwise noted.
(-) = slotted head

5-3.


A
B
C
D
E
1
2
3
1-516-963-00
Switch, lever slide, TAPE SELECT (S303)
1-226-619-00
Resistor, variable 100k-BX2, BASS (RV302)
1-226-620-00
Resistor, variable 100k-AX2;
TREBLE (RV301)
1-516-945-00
Switch, leverslide,
REC MODE (S304)
3-566-514-00
Contact, antenna
1-501-213-00
Antenna, telescopic (ANT 1)
3-703-099-00
Cushion, microphone
1-226-491-00
Resistor, variable 20k-AX2; VOLUME (RV101, 201)
1-226-491-00
Resistor, variable;
20k-A; MIX
MIC FADER
(RV303)
♠ 1-601-017-00
Printed Circuit Board, microphone
X-3566-511-0
Control Assy, OPERATION /TAPE SELECT/
REC MODE
1-552-606-00
Switch, leverslide; OPERATION (S305)
3-566-569-00
Cover, control
TA, BV
3X10
8-814-198-91
Microphone, C1004Q
(MIC101, 201)
3-566-513-00
Contact, antenna
♠ 3-566-525-00
Plate, shield
B 2.6 X 8, black
B3X8, black
♠ A-3270-044-A
Complete Circuit Board, control & audio
1-226-491-00
Resistor, variable
20k-A X2; REC LEVEL
(RV102, 202)
1-507-643-00
Jack, MIC MIX (J301)
PTPWH3X10
1-507-578-00
Jack, EXT SP (J104, 204)
TA,
BV 3X10
3-566-579-00 ⚠
Cover, fuse
1-552-026-00 ⚠
Voltage Selector (S904)
1-507-670-00
Jack, HEADPHONES (J302)
♠ 3-566-564-00
Chassis
TA, BV 3X12
1-553-016-00
Switch, slide; FUNCTION
(S302)
♠ 1-601-448-00 ⚠
Printed Circuit Board,
voltage selector
TA, BV 3X12
1-552-844-21
Switch, slide;
ISS (S308)
9-911-843-XX
Rubber Sheet
⚠ 1-532-387-00
Fuse, T200mA (F901
3-566-578-00 ⚠
Cover, voltage selector
♠ 1-601-019-00
Printed Circuit Board, meter
♠ 3-551-929-00
Holder, heat sink
1-516-637-00
Switch, slide; PHONO/LINE IN (S306)
1-533-131-00
Holder, fuse
PSW 3X8
TA, BV 3X12
3-566-553-00
Holder, LED
X-3563-401-0
Terminal Ass'y, ground
1-561-265-00 ⚠
Connector, AC INPUT/DC IN 12V (CNJ901)
3-566-503-00
Plate, level meter indicatoin
TA, P 3X6
TA,
P 3X6
1-552-763-00
Switch, Slide;
record/playback
(S301)
1-507-607-00
Jack, 2P; LINE OUT (J103, 203)
PSW
3X8
TA, BV 3X12
TA,
BV 3X12
1-442-917-00 ⚠
Transformer, power (T901)
♠ X-3566-512-0
Plate Ass'y, shield
1-507-450-00
Jack, MIC
(J101, 201)
1-507-607-00
Jack, 2P; LINE IN/PHONO (J102, 202)
♠ 3-566-526-00
Heat Sink
♠ 1-551-900-00
Lead wire with connector 4P
3-561-011-00 ⚠
Cover, connector
TA, BV 3X10
TA,
BV3X12
E5
X-3566-511-0
Control Ass'y, FUNCTION
♠ 1-601-447-00
Printed Circuit Board,
power supply
3-566-537-00
Lever, function
3-566-506-00
Cover, control
3-566-521-00
Cover, LED
TA, BV 3X12
TA, BV 3X10
TA, BV
3X12
♠ 3-566-580-00
Bracket, transformer
♠ 3-566-538-00
Lever, switching
♠ X-3566-504-0
Plate Ass'y, function
E5
♠ 3-566-551-00
Plate, shield

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note:
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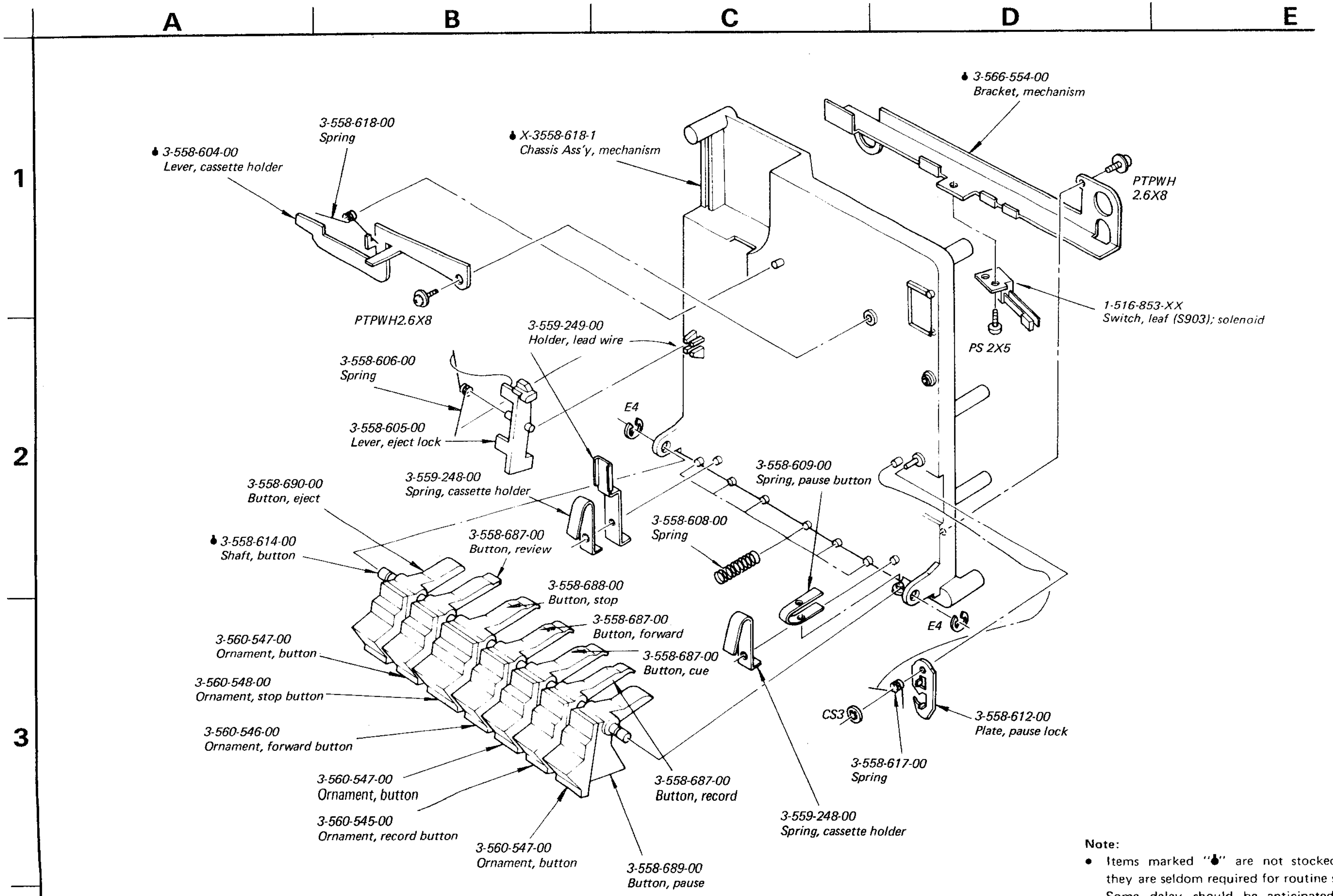
- All screws are Phillips (cross recess) type unless otherwise noted.
(-) = slotted head

5-4.

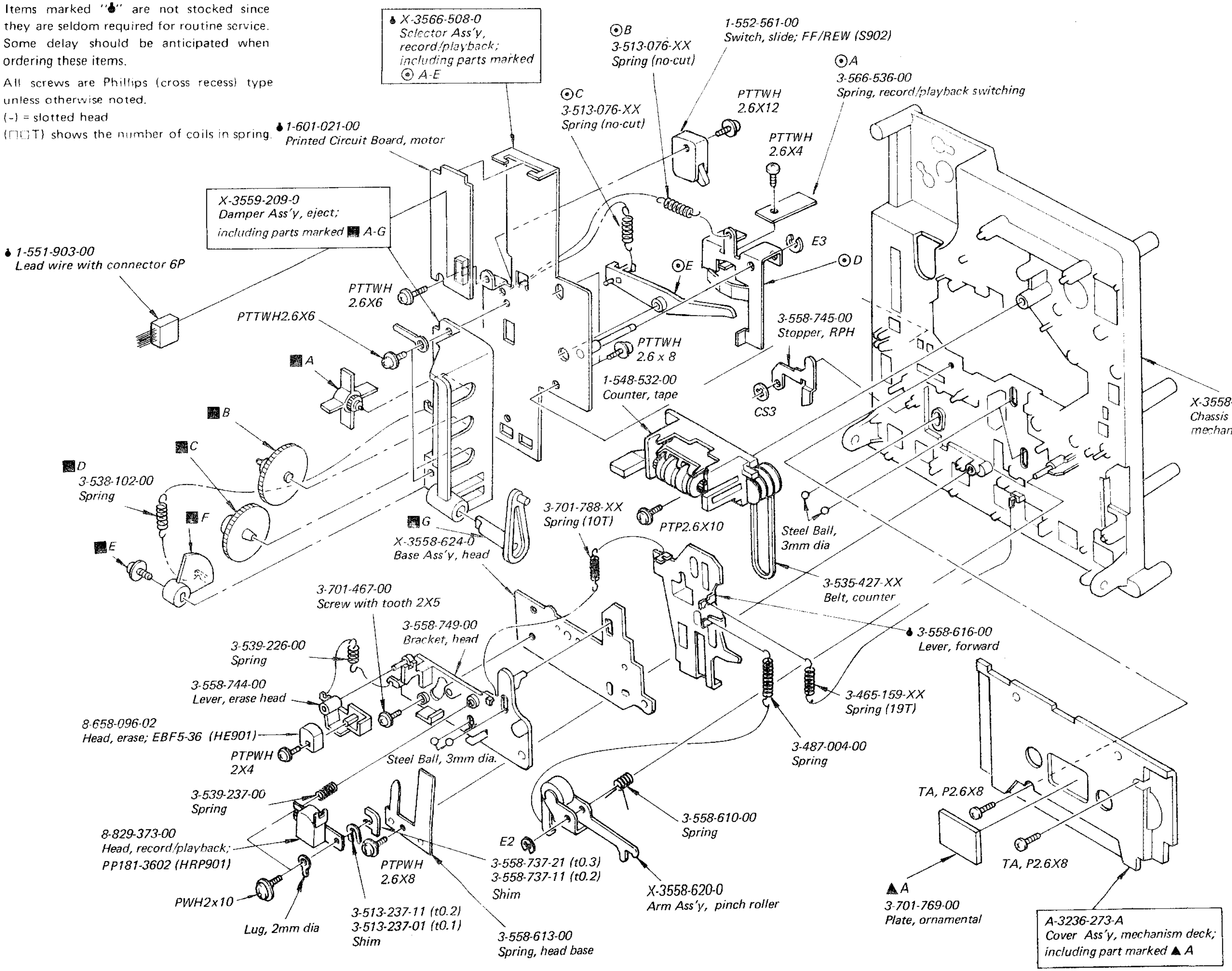

A
B
C
D
E
1
2
3
♦ 3-566-554-00
Bracket, mechanism
PTPWH
2.6X8
1-516-853-XX
Switch, leaf (S903); solenoid
PS 2X5
3-558-618-00
Spring
♦ X-3558-618-1
Chassis Ass'y, mechanism
♦ 3-558-604-00
Lever, cassette holder
PTPWH2.6X8
3-559-249-00
Holder, lead wire
3-558-606-00
Spring
3-558-605-00
Lever, eject lock
E4
3-558-609-00
Spring, pause button
3-558-690-00
Button, eject
3-559-248-00
Spring, cassette holder
3-558-608-00
Spring
♦ 3-558-614-00
Shaft, button
3-558-687-00
Button, review
3-558-688-00
Button, stop
3-558-687-00
Button, forward
3-560-547-00
Ornament, button
3-558-687-00
Button, cue
E4
3-560-548-00
Ornament, stop button
CS3
3-558-612-00
Plate, pause lock
3-560-546-00
Ornament, forward button
3-558-617-00
Spring
3-560-547-00
Ornament, button
3-558-687-00
Button, record
3-560-545-00
Ornament, record button
3-559-248-00
Spring, cassette holder
3-560-547-00
Ornament, button
3-558-689-00
Button, pause

Note:
- Items marked "♦" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (-) = slotted head

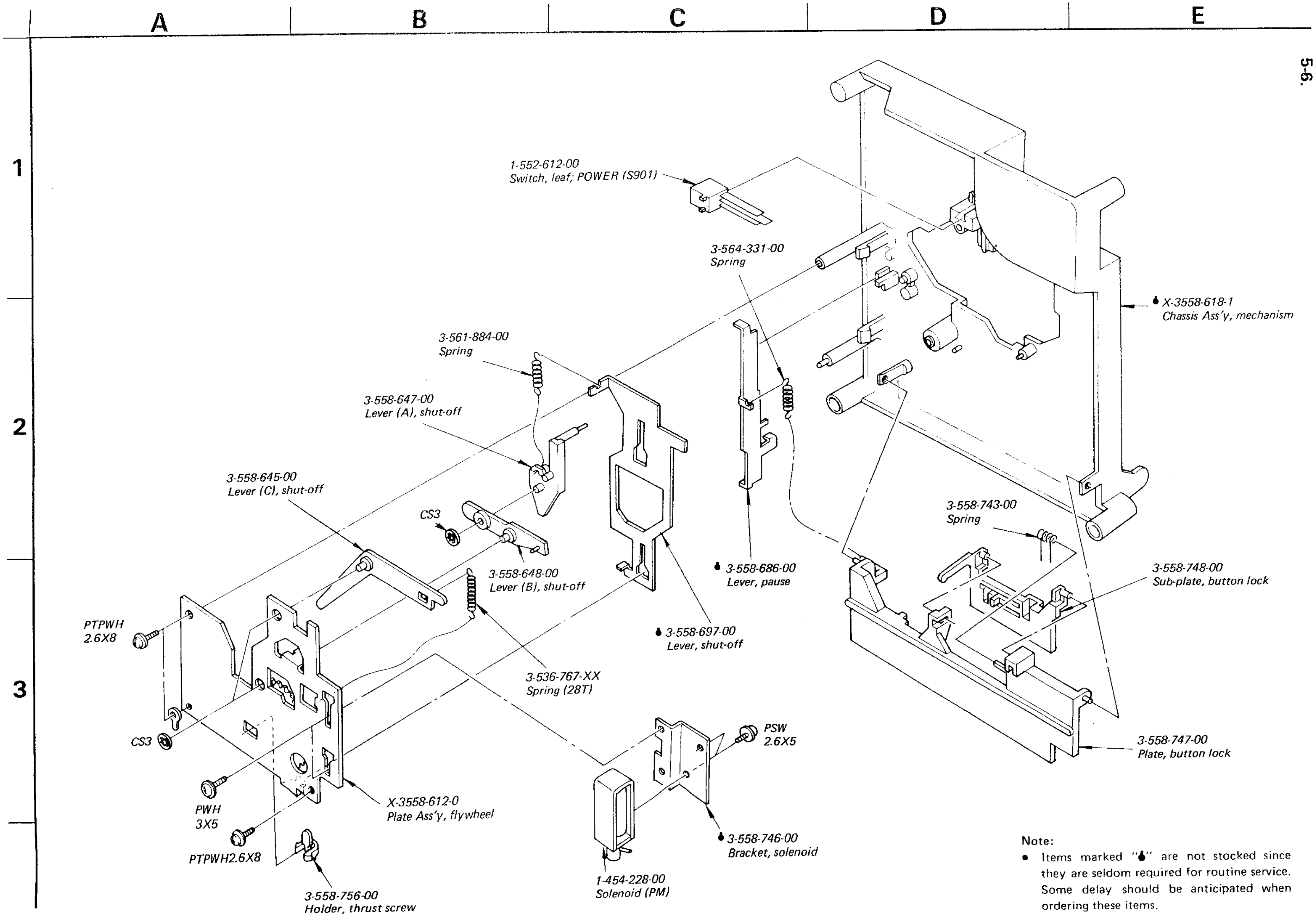
5-5.

Note:

- Items marked "♦" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (-) = slotted head
- (□□T) shows the number of coils in spring.


A
B
C
D
E
1
2
3
♦ X-3566-508-0
Selector Ass'y, record/playback; including parts marked ⊙ A-E
⊙B
3-513-076-XX
Spring (no-cut)
1-552-561-00
Switch, slide; FF/REW (S902)
⊙A
3-566-536-00
Spring, record/playback switching
⊙C
3-513-076-XX
Spring (no-cut)
PTTWH
2.6X12
PTTWH
2.6X4
♦ 1-601-021-00
Printed Circuit Board, motor
X-3559-209-0
Damper Ass'y, eject; including parts marked ■ A-G
♦ 1-551-903-00
Lead wire with connector 6P
E3
⊙E
⊙D
PTTWH
2.6X6
PTTWH2.6X6
3-558-745-00
Stopper, RPH
PTTWH
2.6 x 8
■A
1-548-532-00
Counter, tape
CS3
■B
■C
X-3558-618-1
Chassis Ass'y, mechanism
■D
3-538-102-00
Spring
■F
■G
3-701-788-XX
Spring (10T)
PTP2.6X10
Steel Ball, 3mm dia
■E
X-3558-624-0
Base Ass'y, head
3-535-427-XX
Belt, counter
3-701-467-00
Screw with tooth 2X5
3-558-749-00
Bracket, head
♦ 3-558-616-00
Lever, forward
3-539-226-00
Spring
3-558-744-00
Lever, erase head
3-465-159-XX
Spring (19T)
8-658-096-02
Head, erase; EBF5-36 (HE901)
3-487-004-00
Spring
PTPWH
2X4
Steel Ball, 3mm dia.
TA, P2.6X8
3-539-237-00
Spring
3-558-610-00
Spring
8-829-373-00
Head, record/playback; PP181-3602 (HRP901)
E2
3-558-737-21 (t0.3)
3-558-737-11 (t0.2)
Shim
TA, P2.6X8
PTPWH
2.6X8
X-3558-620-0
Arm Ass'y, pinch roller
PWH2x10
▲A
3-701-769-00
Plate, ornamental
3-513-237-11 (t0.2)
3-513-237-01 (t0.1)
Shim
Lug, 2mm dia
3-558-613-00
Spring, head base
A-3236-273-A
Cover Ass'y, mechanism deck; including part marked ▲ A

5-6.


A
B
C
D
E
1
2
3
1-552-612-00
Switch, leaf; POWER (S901)
3-564-331-00
Spring
♦ X-3558-618-1
Chassis Ass'y, mechanism
3-561-884-00
Spring
3-558-647-00
Lever (A), shut-off
3-558-645-00
Lever (C), shut-off
CS3
3-558-648-00
Lever (B), shut-off
♦ 3-558-686-00
Lever, pause
3-558-743-00
Spring
3-558-748-00
Sub-plate, button lock
♦ 3-558-697-00
Lever, shut-off
PTPWH
2.6X8
3-536-767-XX
Spring (28T)
CS3
PSW
2.6X5
3-558-747-00
Plate, button lock
PWH
3X5
X-3558-612-0
Plate Ass'y, flywheel
PTPWH2.6X8
♦ 3-558-746-00
Bracket, solenoid
1-454-228-00
Solenoid (PM)
3-558-756-00
Holder, thrust screw

Note:

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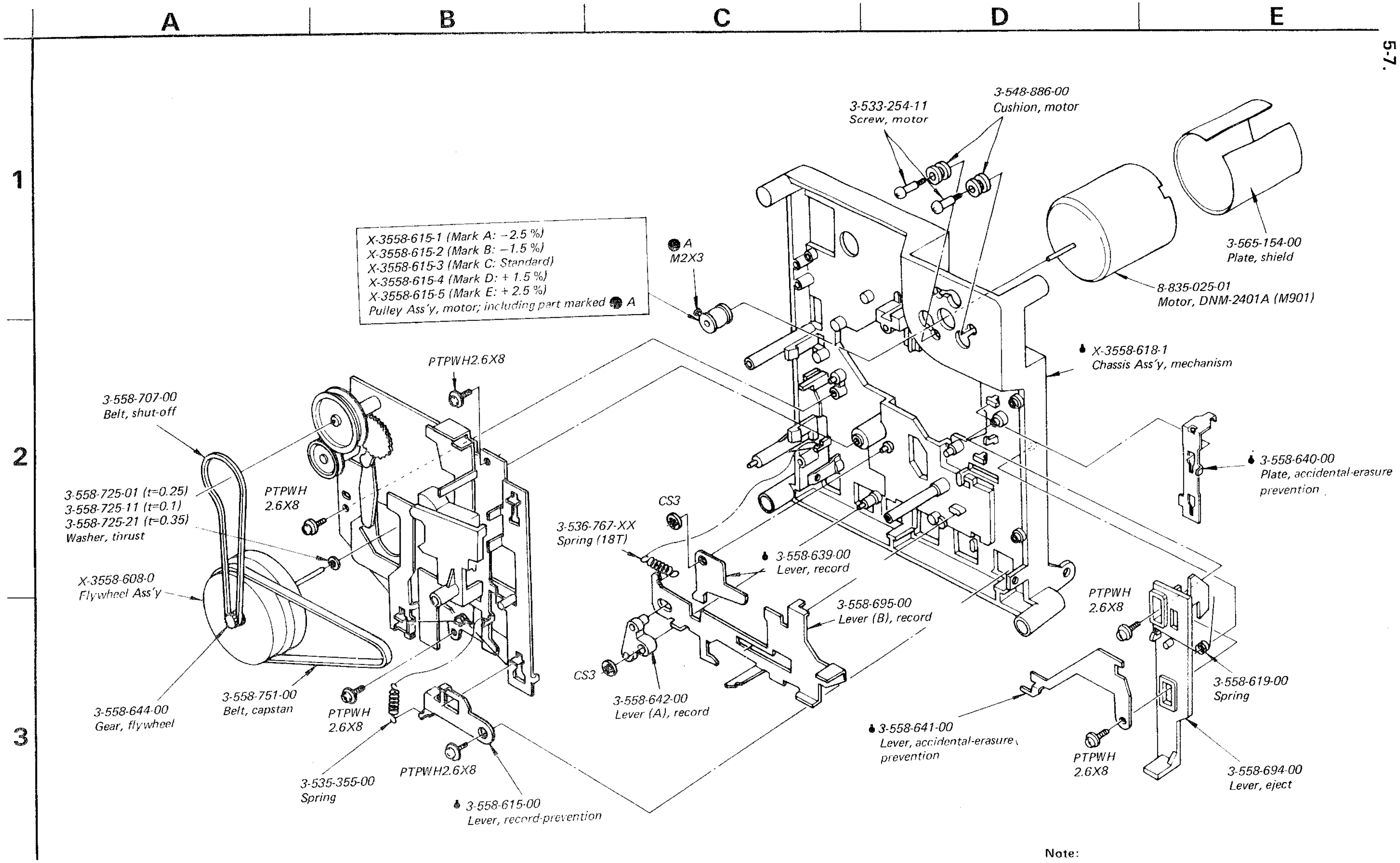
- All screws are Phillips (cross recess) type unless otherwise noted.
  (-) = slotted head
- (□□T) shows the number of coils in spring.

5-7.


A
B
C
D
E
1
2
3
3-533-254-11
Screw, motor
3-548-886-00
Cushion, motor
3-565-154-00
Plate, shield
8-835-025-01
Motor, DNM-2401A (M901)
X-3558-615-1 (Mark A: −2.5 %)
X-3558-615-2 (Mark B: −1.5 %)
X-3558-615-3 (Mark C: Standard)
X-3558-615-4 (Mark D: + 1.5 %)
X-3558-615-5 (Mark E: + 2.5 %)
Pulley Ass'y, motor; including part marked ● A
● A
M2X3
♦ X-3558-618-1
Chassis Ass'y, mechanism
PTPWH2.6X8
3-558-707-00
Belt, shut-off
♦ 3-558-640-00
Plate, accidental-erasure prevention
3-558-725-01 (t=0.25)
3-558-725-11 (t=0.1)
3-558-725-21 (t=0.35)
Washer, thrust
PTPWH
2.6X8
CS3
3-536-767-XX
Spring (18T)
♦ 3-558-639-00
Lever, record
X-3558-608-0
Flywheel Ass'y
3-558-695-00
Lever (B), record
PTPWH
2.6X8
CS3
3-558-619-00
Spring
3-558-644-00
Gear, flywheel
3-558-751-00
Belt, capstan
PTPWH
2.6X8
3-558-642-00
Lever (A), record
♦ 3-558-641-00
Lever, accidental-erasure prevention
PTPWH
2.6X8
3-558-694-00
Lever, eject
3-535-355-00
Spring
PTPWH2.6X8
♦ 3-558-615-00
Lever, record-prevention

Note:

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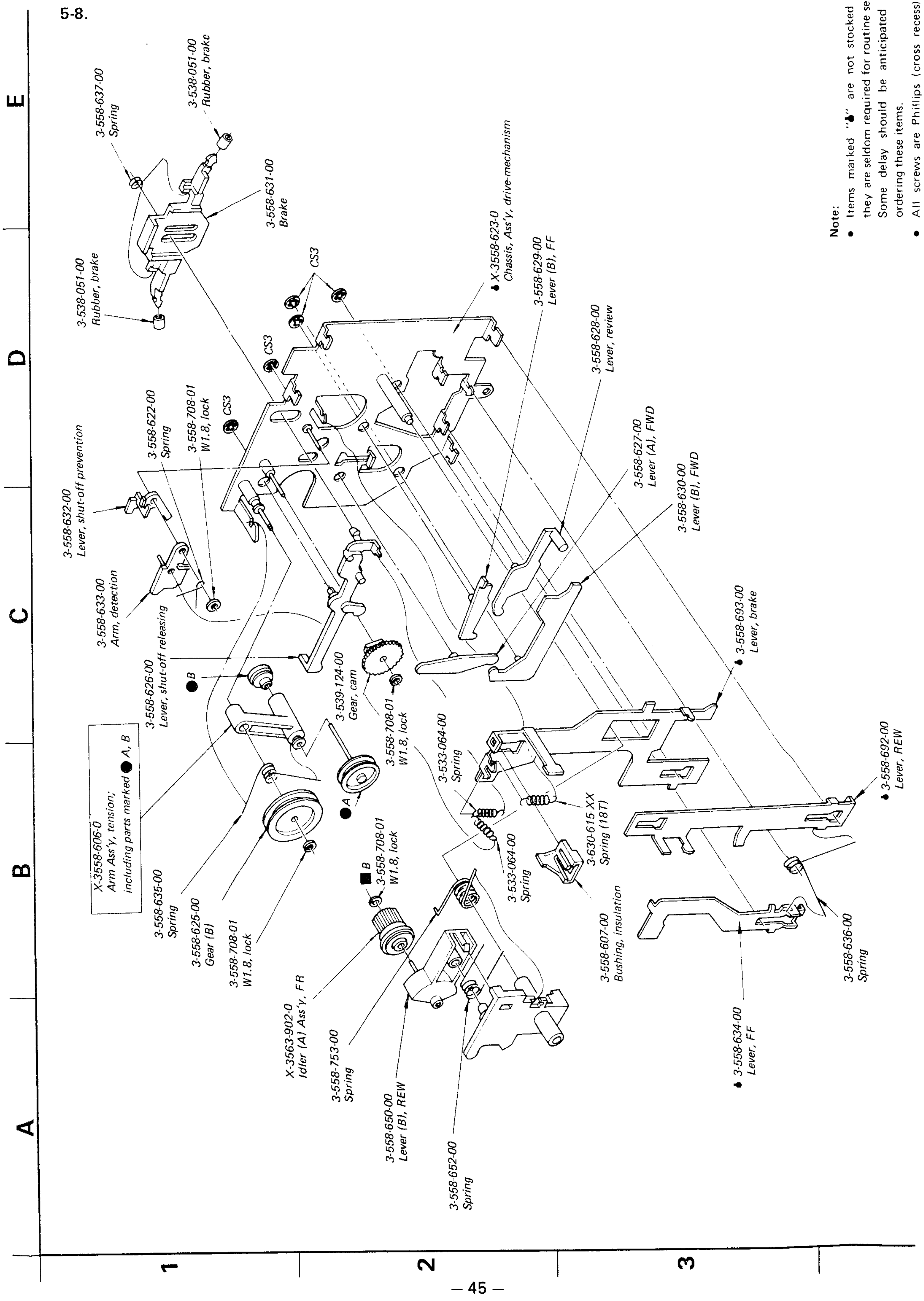
- All screws are Phillips (cross recess) type unless otherwise noted.
  (-) = slotted head
- (□□T) shows the number of coils in spring.

5-8.


E
D
C
B
A
1
2
3
3-558-637-00
Spring
3-538-051-00
Rubber, brake
3-558-631-00
Brake
3-538-051-00
Rubber, brake
CS3
CS3
CS3
♦ X-3558-623-0
Chassis, Ass'y, drive-mechanism
3-558-629-00
Lever (B), FF
3-558-628-00
Lever, review
3-558-627-00
Lever (A), FWD
3-558-630-00
Lever (B), FWD
3-558-622-00
Spring
3-558-708-01
W1.8, lock
3-558-632-00
Lever, shut-off prevention
3-558-633-00
Arm, detection
3-558-626-00
Lever, shut-off releasing
● B
3-539-124-00
Gear, cam
3-558-708-01
W1.8, lock
● A
X-3558-606-0
Arm Ass'y, tension;
including parts marked ● A, B
3-558-635-00
Spring
3-558-625-00
Gear (B)
3-558-708-01
W1.8, lock
■ B
3-558-708-01
W1.8, lock
3-533-064-00
Spring
3-533-064-00
Spring
3-630-615-XX
Spring (18T)
3-558-607-00
Bushing, insulation
♦ 3-558-693-00
Lever, brake
♦ 3-558-692-00
Lever, REW
3-558-636-00
Spring
♦ 3-558-634-00
Lever, FF
X-3563-902-0
Idler (A) Ass'y, FR
3-558-753-00
Spring
3-558-650-00
Lever (B), REW
3-558-652-00
Spring

Note:

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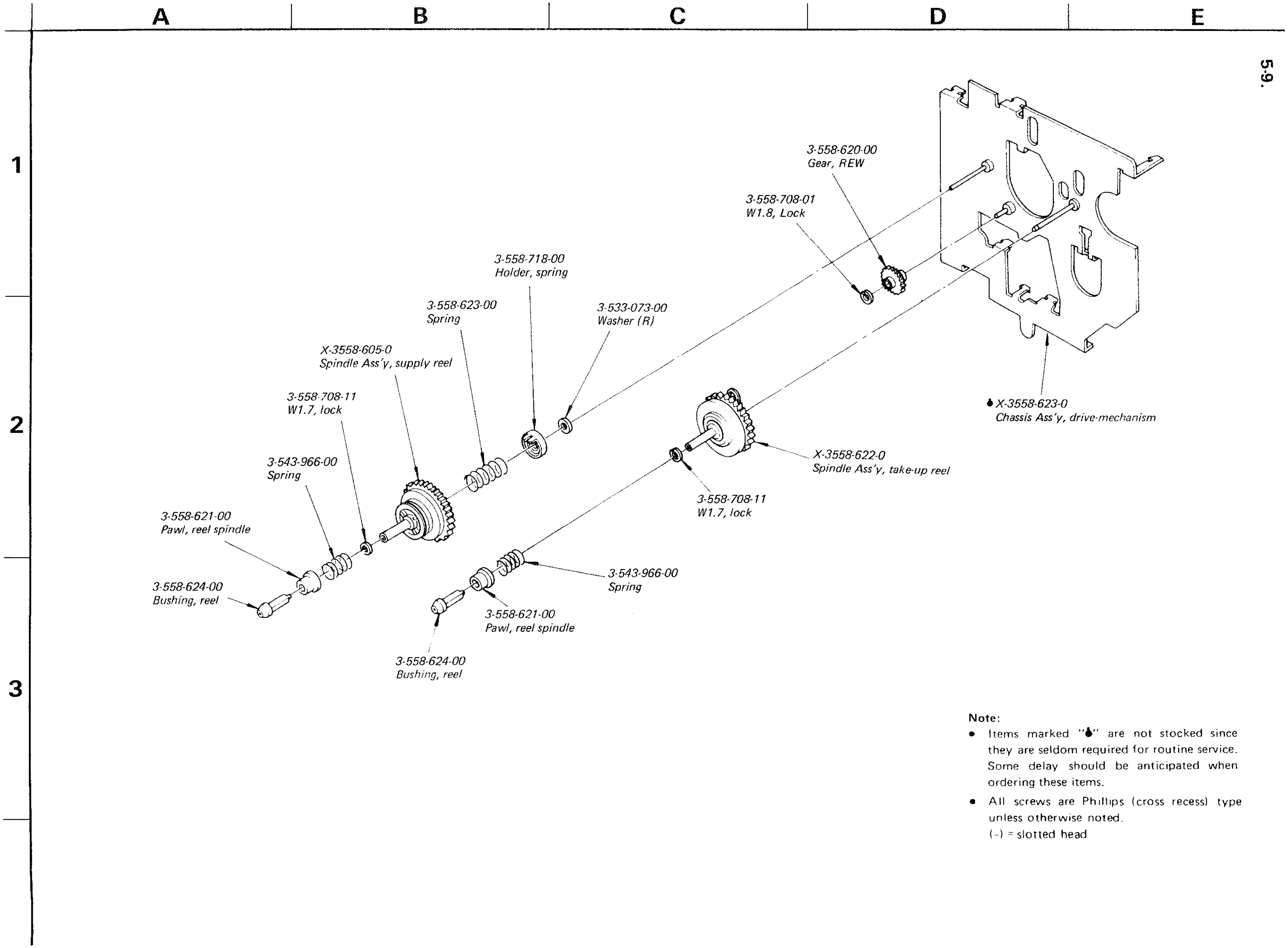
  (–) = slotted head
- (□□T) shows the number of coils in spring

5-9.


A
B
C
D
E
1
2
3
3-558-620-00
Gear, REW
3-558-708-01
W1.8, Lock
3-558-718-00
Holder, spring
3-558-623-00
Spring
3-533-073-00
Washer (R)
X-3558-605-0
Spindle Ass'y, supply reel
3-558-708-11
W1.7, lock
3-543-966-00
Spring
3-558-621-00
Pawl, reel spindle
3-558-624-00
Bushing, reel
♦ X-3558-623-0
Chassis Ass'y, drive-mechanism
X-3558-622-0
Spindle Ass'y, take-up reel
3-558-708-11
W1.7, lock
3-543-966-00
Spring
3-558-621-00
Pawl, reel spindle
3-558-624-00
Bushing, reel

Note:

- Items marked "♦" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (-) = slotted head

SECTION 6
ELECTRICAL PARTS LIST

COMPLETE CIRCUIT BOARDS

Ref. No.	Part No.	Description
	♠ A-3266-097-A	Radio
	♠ A-3270-044A	Audio and Control

PRINTED CIRCUIT BOARDS

Ref. No.	Part No.	Description
	♠ 1-601-013-00	AMS Switch
	♠ 1-601-014-00	Connection
	♠ 1-601-015-00	Network (R)
	♠ 1-601-016-00	Network (L)
	♠ 1-601-017-00	Microphone
	♠ 1-601-019-00	Meter
	♠ 1-601-021-00	Motor
	♠ 1-601-445-00	Mode Switch
	♠ 1-601-446-00	LED
	♠ 1-601-447-00	Power Supply
	⚠♠ 1-601-448-00	Voltage Selector

SEMICONDUCTORS

Transistors

Ref. No.	Part No.	Description
⇒Q1	8-729-803-04	2SC930
Q2, 3	8-729-806-84	2SC668
⇒Q4	8-729-806-14	2SC710-14
⇒Q5–7	8-729-671-13	2SC710-13
⇒Q8	8-729-803-04	ESC930
⇒Q9	8-729-671-14	2SC710-14
⇒Q10, 11	8-729-663-47	2SC1364
⇒Q101, 201	8-729-665-47	2SC1362
⇒Q102, 202	8-729-663-47	2SC1364
⇒Q103, 203	8-729-665-47	2SC1362
⇒Q104–106	8-729-663-47	2SC1364
⇒Q204–206	8-729-663-47	2SC1364
⇒Q301, 302	8-729-665-47	2SC1362
⇒Q303–307	8-729-663-47	2SC1364
Q308	8-729-217-33	2SC1173
⇒Q309	8-729-663-47	2SC1364
⇒Q310	8-729-612-77	2SA1027R
⇒Q311	8-729-663-47	2SC1364
⇒Q601	8-729-612-77	2SA1027R
⇒Q602–604	8-729-663-47	2SC1364
Q605	8-729-217-33	2SC1173
⇒Q606–608	8-729-663-47	2SC1364
Q901	8-729-217-33	2SC1173

ICs

Ref. No.	Part No.	Description
IC1	8-759-833-01	LA3301
IC301	8-759-313-77	HA1377A
⇒IC501, 502	8-759-814-05	LB1405
⇒IC511, 512	8-759-814-05	LB1405
IC601	8-759-832-10	LA3210
IC602	8-759-240-01	TC4001BP
⇒IC603	8-759-940-27	MSM4027
⇒IC604	8-759-240-11	TC4011BP
⇒IC605	8-759-240-81	TC4081BP

Diodes

Ref. No.	Part No.	Description
⇒D1	8-719-768-71	1S2687S-1
D2, 3	8-719-026-11	1T261
⇒D4, 5	8-719-422-21	1T22AM
D6	8-719-815-55	1S1555
D501, 502 D511, 512	1-800-753-11	LED Block
D521–523	8-719-900-41	SLP141B
⇒D601, 603 ⇒D604	8-719-815-55	1S1555
⇒D606–609	8-719-815-55	1S1555
D701, 702	8-719-900-41	SLP141B
D801, 802	8-719-200-02	10E2
D902	8-719-200-02	10E2
⇒D903	8-719-191-07	RD9.1E

COILS

Ref. No.	Part No.	Description
L1	1-407-175-XX	330μH, microinductor
L2	1-425-632-00	FM RF
L3	1-459-157-00	FM OSC
L4	1-407-178-XX	1μH, microinductor
L901, 902	1-407-484-00	3.3μH, microinductor

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

- Items marked "♠" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

TRANSFORMERS

Ref. No.	*Part No.*	*Description*
T1	1-403-872-00	FM IFT
T2	1-403-952-00	FM Discriminator
T3	1-403-953-00	FM Discriminator
T4	1-404-041-00	AM Detection
T5	1-405-520-00	MW OSC
T6	1-403-144-00	AM IFT
T7	1-405-740-00	SW2 OSC
T8	1-405-739-00	SW1 OSC
T9	1-401-538-00	SW2 ANT
T10, 11	1-425-956-00	MPX
T12	1-401-584-00	SW1 Antenna
T301	1-433-206-00	BIAS Oscillator
T901	⚠1-442-917-00	Power

CAPACITORS

All capacitors are in μF and ceramic unless otherwise noted. 50WV or less are not indicated except for electrolytics.
Common capacitors are omitted. Refer to the lists on page 51 and 52 for their part numbers.

Ref. No.	*Part No.*	*Description*		
C7	1-102-511-00	13p	ceramic	
C8	1-102-504-00	4p	ceramic	
C9	1-102-865-00	8p	ceramic	
C11	1-102-504-00	4p	ceramic	
C49	1-130-030-00	0.01	film	
C55	1-130-147-11	0.0024	film	
C901	1-123-231-00	3.3	50V	elect (bipolar)
C902	1-123-232-00	4.7	50V	elect (bipolar)
C903	1-123-231-00	3.3	50V	elect (bipolar)
C904	1-123-232-00	4.7	50V	elect (bipolar)
CT1–3 CV1–4	1-151-239-00	Variable		
CT4–8	1-141-179-00	Trimmer		
CT9	1-141-192-00	FINE TUNING		

RESISTORS

All resistors are in ohms. Common ¼W carbon resistors are omitted. Refer to the list on page 50 for their part numbers.

Ref. No.	*Part No.*	*Description*
R332, 902	⚠1-212-948-00	3.9 ½W fusible
RV1	1-226-233-00	1k-B, adjustable; FM SEPARATION
RV101, 201	1-226-491-00	20k-A×2, variable; VOLUME
RV103	1-226-234-00	2k-B, adjustable; LEVEL METER (L)
RV102, 202	1-226-491-00	20k-A×2, variable; REC LEVEL
RV301	1-226-620-00	100k-A×2, variable; TREBLE
RV302	1-226-619-00	100k-B×2, variable; BASS
RV303	1-226-491-00	20k-A, variable; MIX MIC FADER
RV304	1-226-238-00	50k-B, adjustable; B+ VOLTAGE
RV305	1-226-237-00	20k-B, adjustable; BATTERY INDICATOR

JACKS

Ref. No.	*Part No.*	*Description*
J101, 201	1-507-450-00	MIC
J102, 202 J103, 203	1-507-607-00	LINE IN/PHONO, LINE OUT
J104, 204	1-507-578-00	EXT SP
J301	1-507-643-00	MIX MIC
J302	1-507-670-00	HEADPHONES

SWITCHES

Ref. No.	*Part No.*	*Description*
S1	1-516-332-00	Slide, BAND SELECT
S301	1-552-763-00	Slide, record/playback
S302	1-553-016-00	Slide, FUNCTION
S303	1-516-963-00	Leverslide, TAPE SELECT
S304	1-516-945-00	Leverslide, REC MODE
S305	1-552-606-00	Leverslide, OPERATION
S306	1-516-637-00	Slide, PHONO/LINE IN
S308	1-552-844-21	Slide, ISS
S601	1-552-762-00	Keyboard, PROGRAM
S701	1-516-961-00	Leverslide, FM MODE
S901	1-552-612-00	Leaf, POWER
S902	1-552-561-00	Slide, FF/REW
S903	1-516-853-XX	Leaf, solenoid
S904	⚠1-552-026-00	Voltage Selector

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

MISCELLANEOUS

Ref. No.	*Part No.*	*Description*
ANT1	1-501-213-00	Antenna, telescopic
ANT2	1-401-756-00	Ferrite-rod Antenna, MW
CF1, 2	1-527-184-XX	Ceramic Filter
CNJ901	⚠1-561-265-00	Connector, AC INPUT/DC IN 12V
♠CNP1	1-560-082-00	Pin connector 4p
♠CNP301	1-560-091-00	Pin connector 4p
♠CNP801	1-560-080-00	Pin connector 2p
♠CNP901	1-560-083-00	Pin connector 5p
♠CNP902	1-560-084-00	Pin connector 6p
CP1	1-231-286-00	Bandpass filter
F901	⚠1-532-387-00	Fuse, T200mA
HE901	8-658-096-02	Head, erase; EBF5-36
HRP901	8-829-373-00	Head, record/playback; PP181-3602
M901	8-535-025-01	Motor, DNM-2401A
MIC101, 201	8-814-198-91	Microphone, C1004Q
PM	1-454-228-00	Solenoid
SP901, 904	1-502-851-00	Speaker, woofer
SP902, 905	1-502-852-00	Speaker, tweeter
SP903, 906	1-502-823-00	Speaker, midrange
TH301, 302	1-800-202-XX	Thermistor S-10k
	⚠1-533-131-00	Holder, fuse
	♠1-551-899-00	Lead wire with connector 2p
	♠1-551-900-00	Lead wire with connector 4p
	♠1-551-901-00	Lead wire with connector 4p
	♠1-551-902-00	Lead wire with connector 5p
	♠1-551-903-00	Lead wire with connector 6p

ACCESSORIES AND PACKING MATERIALS

Part No.	*Description*
⚠1-551-235-00	Cord, POWER; DK-51 parallel-blade plug
⚠1-551-521-00	Cord, POWER; DK-52 Europlug
1-561-235-00	Antenna connector
3-566-562-00	Cushion, right
3-566-563-00	Cushion, left
3-566-568-00	Stopper
3-566-582-00	Bag, protection
3-566-587-00	Carton
3-701-630-00	Bag, polyethylene
3-701-684-11	Card, indicating
3-783-011-51	Manual, instruction
3-794-594-51	Instruction, Korea
3-794-595-51	Instruction, Arabic
8-893-521-10	Tape CD-810

- Items marked "♠" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

1/4 WATT CARBON RESISTORS Ⓐ

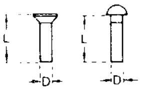
Note: Circled letter Ⓐ is applicable to European models only.

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-576-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-577-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-578-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-579-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-580-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-581-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-582-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-583-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-584-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-585-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-586-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-587-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

HARDWARE NOMENCLATURE

Screw: – P 3 x 10

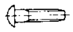
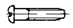
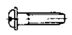
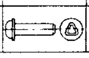
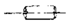
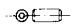
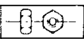
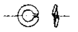
L: *Length in mm*
D: *Diameter in mm*
Type of head
Indicated slotted-head only.
Unless otherwise indicated, it means cross-recessed head (Phillips type).



Nut, Washer, Retaining ring:

N 3
Diameter of usable screw or shaft
Reference designation

Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

ELECTROLYTIC CAPACITORS

Note: Circled letter (Ⓐ to Ⓩ) are applicable to European models only.

	RATING				→ : Use the high voltage rated one.	
CAP. (μF)	6.3 VOLT.	10 VOLT.	16 VOLT.	25 VOLT.	35 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.47					→	1-121-726-00 Ⓐ
1.0					→	1-121-391-00 Ⓐ
2.2					→	1-121-450-00 Ⓐ
3.3	→	→	→	1-121-392-00 Ⓐ	→	1-121-393-00 Ⓐ
4.7	→	→	→	1-121-395-00 Ⓐ	→	1-121-396-00 Ⓐ
10	→	→	1-121-651-00 Ⓐ	1-121-398-00 Ⓐ	→	1-121-738-00 Ⓐ
22	→	→	1-121-479-00 Ⓐ	1-121-480-00 Ⓐ	1-121-662-00 Ⓐ	1-121-152-00 Ⓐ
33	→	→	1-121-403-00 Ⓐ	1-121-404-00 Ⓐ	1-121-652-00 Ⓑ	1-121-405-00 Ⓐ
47	→	1-121-352-00 Ⓐ	1-121-409-00 Ⓐ	1-121-410-00 Ⓐ	1-121-653-00 Ⓑ	1-121-411-00 Ⓐ
100	→	1-121-414-00 Ⓐ	1-121-415-00 Ⓐ	1-121-416-00 Ⓐ	1-121-357-00 Ⓑ	1-121-417-00 Ⓑ
220	1-121-419-00 Ⓑ	1-121-420-00 Ⓑ	1-121 421-00 Ⓐ	1-121-422-00 Ⓑ	1-121-261-00 Ⓒ	1-121-423-00 Ⓑ
330	1-121-751-00 Ⓑ	1-121-805-00 Ⓑ	1-121-521-00 Ⓒ	1-121-654-00 Ⓑ	1-121-655-00 Ⓓ	1-121-656-00 Ⓒ
470	1-121-424-00 Ⓑ	1-121-425-00 Ⓒ	1-121-426-00 Ⓒ	1-121-733-00 Ⓑ	1-121-361-00 Ⓕ	1-121-810-00 Ⓓ
1000	–	1-121-736-00 Ⓒ	1-121-245-00 Ⓓ	1-121-657-00 Ⓓ	1-121-388-00 Ⓔ	1-123-061-00 Ⓕ
2200	1-121-658-00 Ⓑ	1-121-659-00 Ⓒ	1-121-660-00 Ⓓ	1-123-067-00 Ⓕ	1-121-984-00 Ⓕ	–
3300	1-121-661-00 Ⓓ	1-123-075-00 Ⓔ	1-123-071-00 Ⓕ	–	–	–

CAP. (μF)	100 VOLT.	160 VOLT.	250 VOLT.	350 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.47	–	–	–	–
1.0	1-123-249-00 Ⓐ	1-123-252-00 Ⓐ	1-123-003-00 Ⓑ	1-121-168-00 Ⓑ
2.2	1-123-250-00 Ⓐ	1-123-026-00 Ⓑ	–	1-123-028-00 Ⓑ
3.3	1-121-995-00 Ⓐ	–	1-123-004-00 Ⓑ	1-123-006-00 Ⓒ
4.7	1-123-255-00 Ⓐ	1-121-246-00 Ⓑ	1-121-759-00 Ⓑ	1-123-007-00 Ⓓ
10	1-121-126-00 Ⓑ	1-121-999-00 Ⓑ	1-123-254-00 Ⓒ	1-123-008-00 Ⓓ
22	1-121-996-00 Ⓒ	1-123-253-00 Ⓒ	1-123-005-00 Ⓓ	1-123-022-00 Ⓓ
33	1-121-997-00 Ⓒ	1-121-757-00 Ⓒ	–	–
47	1-123-251-00 Ⓒ	1-121-919-00 Ⓒ	–	–
100	1-123-084-00 Ⓔ	–	–	–

CERAMIC CAPACITORS Ⓐ

			RATING				
CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (μF)	50 VOLT.
	PART No.		PART No.		PART No.		PART No.
0.5	1-101-837-00	22	1-102-959-00	150	1-101-361-00	0.001	1-102-074-00
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.0012	1-102-118-00
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015	1-102-119-00
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0018	1-102-120-00
2.0	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022	1-102-121-00
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027	1-102-122-00
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033	1-102-123-00
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0039	1-102-124-00
6	1-102-943-00	47	1-101-880-00	330	1-102-820-00	0.0047	1-102-125-00
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056	1-102-126-00
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0068	1-102-127-00
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0082	1-102-128-00
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01	1-102-129-00
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.022	1-101-005-00
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.047	1-101-006-00
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00		
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00		
16	1-102-952-00	110	1-102-815-00				
18	1-102-953-00	120	1-102-816-00				
20	1-102-958-00	130	1-101-081-00				

0.001μF = 1,000pF

CERAMIC (SEMICONDUCTOR) CAPACITORS Ⓐ

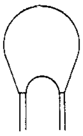
			RATING	→ : Use the high voltage rated one.	
CAP. (μF)	25 VOLT.	50 VOLT.	CAP. (μF)	25 VOLT.	50 VOLT.
	PART No.	PART No.		PART No.	PART No.
0.001	→	1-161-039-00	0.018	1-161-016-00	1-161-054-00
0.0012	→	1-161-040-00	0.022	1-161-017-00	1-161-055-00
0.0015		1-161-041-00	0.027	1-161-018-00	1-161-056-00
0.0018		1-161-042-00	0.033	1-161-019-00	1-161-057-00
0.0022		1-161-043-00	0.039	1-161-010-00	1-161-058-00
0.0027	→	1-161-044-00	0.047	1-161-021-00	1-161-059-00
0.0033	→	1-161-045-00	0.056	→	1-161-060-00
0.0039	→	1-161-046-00	0.068	→	1-161-061-00
0.0047	→	1-161-047-00	0.082	1-161-024-00	1-161-062-00
0.0056	→	1-161-048-00	0.1	1-161-025-00	1-161-063-00
0.0068	→	1-161-049-00			
0.0082	1-161-012-00	1-161-050-00			
0.01	1-161-013-00	1-161-051-00			
0.012	→	1-161-052-00			
0.015	1-161-015-00	1-161-053-00			

MYLAR CAPACITORS Ⓐ

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

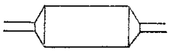
	RATING										
CAP. (µF)	50 VOLT.	100 VOLT.	200 VOLT.	CAP. (µF)	50 VOLT.	100 VOLT.	200 VOLT.	CAP. (µF)	50 VOLT.	100 VOLT.	200 VOLT.
	PART No.	PART No.	PART No.		PART No.	PART No.	PART No.		PART No.	PART No.	PART No.
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00
0.0022	1-108-230-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	–	–
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	–	–
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	–	–
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	–	–
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00				
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00				
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00				

TANTALUM CAPACITORS



	RATING			→: Use the high voltage rated one.			
CAP. (µF)	3.15 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	25 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.01					→	→	1-131-396-00 Ⓑ
0.015						→	1-131-397-00 Ⓑ
0.022						→	1-131-398-00 Ⓑ
0.033						→	1-131-399-00 Ⓑ
0.047						→	1-131-400-00 Ⓑ
0.068					→	→	1-131-401-00 Ⓑ
0.1					→	→	1-131-402-00 Ⓑ
0.15					→	→	1-131-403-00 Ⓑ
0.22					→	→	1-131-404-00 Ⓑ
0.33					→	1-131-409-00 Ⓑ	1-131-405-00 Ⓑ
0.47	–	–	–	–	1-131-412-00 Ⓑ	→	1-131-406-00 Ⓑ
0.68	–	–	–	1-131-415-00 Ⓑ	→	1-131-410-00 Ⓑ	1-131-407-00 Ⓑ
1.0	–	–	1-131-418-00 Ⓑ	–	1-131-413-00 Ⓑ	→	1-131-408-00 Ⓑ
1.5	–	1-131-421-00 Ⓑ	–	1-131-416-00 Ⓑ	→	1-131-411-00 Ⓑ	1-131-348-00 Ⓑ
2.2	1-131-424-00 Ⓑ	–	1-131-419-00 Ⓑ	–	1-131-414-00 Ⓑ	1-131-355-00 Ⓑ	1-131-349-00 Ⓑ
3.3	–	1-131-422-00 Ⓑ	–	1-131-417-00 Ⓑ	1-131-362-00 Ⓑ	1-131-356-00 Ⓑ	1-131-350-00 Ⓑ
4.7	1-131-425-00 Ⓑ	–	1-131-420-00 Ⓑ	1-131-369-00 Ⓑ	1-131-363-00 Ⓑ	1-131-357-00 Ⓑ	1-131-351-00 Ⓒ
6.8	–	1-131-423-00 Ⓑ	1-131-376-00 Ⓑ	1-131-370-00 Ⓑ	1-131-364-00 Ⓑ	1-131-358-00 Ⓒ	1-131-352-00 Ⓒ
10	1-131-426-00 Ⓑ	1-131-383-00 Ⓑ	1-131-377-00 Ⓑ	1-131-371-00 Ⓑ	1-131-365-00 Ⓒ	1-131-359-00 Ⓒ	1-131-353-00 Ⓓ
15	1-131-390-00 Ⓑ	1-131-384-00 Ⓑ	1-131-378-00 Ⓑ	1-131-372-00 Ⓑ	1-131-366-00 Ⓒ	1-131-360-00 Ⓓ	–
22	1-131-391-00 Ⓑ	1-131-385-00 Ⓑ	1-131-379-00 Ⓒ	1-131-373-00 Ⓒ	1-131-367-00 Ⓓ		
33	1-131-392-00 Ⓑ	1-131-386-00 Ⓒ	1-131-380-00 Ⓒ	1-131-374-00 Ⓓ			
47	1-131-393-00 Ⓒ	1-131-387-00 Ⓒ	1-131-381-00 Ⓓ	–			
68	1-131-394-00 Ⓑ	1-131-388-00 Ⓒ	–	–			
100	1-131-395-00 Ⓓ	–	–	–			

TANTALUM CAPACITORS



	RATING					
CAP. (µF)	3 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.033						1-131-273-00 Ⓓ
0.047						1-131-274-00 Ⓓ
0.068						1-131-275-00 Ⓓ
0.1						1-131-276-00 Ⓓ
0.15						1-131-277-00 Ⓓ
0.22			–	–	1-131-262-00 Ⓓ	1-131-278-00 Ⓓ
0.33			–	–	1-131-263-00 Ⓓ	1-131-279-00 Ⓓ
0.47			1-131-169-00 Ⓓ	–	1-131-264-00 Ⓓ	1-131-280-00 Ⓓ
0.68			–	1-131-258-00 Ⓓ	1-131-265-00 Ⓓ	1-131-281-00 Ⓓ
1.0			1-131-254-00 Ⓓ	–	1-131-266-00 Ⓓ	1-131-282-00 Ⓓ
1.5		1-131-250-00 Ⓓ	–	–	1-131-267-00 Ⓓ	1-131-283-00 Ⓔ
2.2		–	–	1-131-259-00 Ⓓ	1-131-268-00 Ⓓ	1-131-284-00 Ⓔ
3.3		–	1-131-255-00 Ⓓ	–	1-131-269-00 Ⓓ	–
4.7		1-131-251-00 Ⓔ	1-131-171-00 Ⓓ	–	1-131-270-00 Ⓓ	–
6.8		–	–	1-131-260-00 Ⓓ	1-131-271-00 Ⓔ	–
10	–	–	1-131-256-00 Ⓓ	–	1-131-272-00 Ⓔ	–
15	–	1-131-252-00 Ⓓ	–	1-131-261-00 Ⓔ		
22	–	–	1-131-257-00 Ⓔ	–		
33	1-131-176-00 Ⓓ	1-131-253-00 Ⓔ	1-131-173-00 Ⓒ	–		
47	1-131-288-00 Ⓕ	1-131-174-00 Ⓓ	–	–		
100	1-131-177-00 Ⓓ					

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